



Broadband in Washington

2012 Annual Report



Washington State Department of Commerce



The Washington State Broadband Office could not have produced this report without the ongoing support of the Department of Commerce and the assistance of broadband stakeholders from across the state. Information about the areas of broadband availability, technology and speeds, as well as our state's national broadband ranking, come from information voluntarily supplied by 113 broadband providers.

Photos included in this report come from a number of organizations including the Department of Commerce, Pace Engineers Inc., NoaNet and the Ed Lab Group. For these images we are very much obliged.

We are also thankful for the insight provided by the Broadband Advisory Council, which is drawn from public and private organizations with substantial history and knowledge of the broadband ecosystem. The Council not only provided the recommendations included in this report but also served as reviewers, providing their thoughtful feedback.

This report's graphic design and layout by Cheri Huber of Cheri Huber Design and the faithful copyediting of our colleague at the Department of Commerce, Brad Wright, also helped us present our information in a clear and user-friendly format.

We look forward to continuing our work in the next few years with these and the many other broadband stakeholders of the state of Washington.

A handwritten signature in blue ink, appearing to read "Will Saunders", is positioned above the printed name and title.

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Executive Summary

For Washington's broadband ecosystem, 2012 was a year of building. The biggest part of the more than \$185 million in American Recovery and Reinvestment Act (ARRA) grants awarded in Washington State for infrastructure was spent in 2012. Another \$7 million of ARRA money was awarded in the state for public computing centers and broadband adoption work. All told, ARRA grants funded more than 1,000 miles of fiber optic infrastructure, hundreds of new computers for classrooms, and computer centers that made possible hundreds of hours of technology instruction.

Private investment in Washington broadband also was robust during 2012. Frontier Communications spent \$27 million in system upgrades; Comcast invested more than \$100 million in the same time period. Wireless broadband providers expanded their services and added more 4G coverage to the state's broadband map. For detailed broadband maps, see Appendix A.

As a result of the extensive private and public investment, more than 500 of Washington's 629 census "places" (which include incorporated and unincorporated communities) saw an increase in speeds in 2012 because of improved wireline broadband access, improved wireless broadband coverage, or both. For example, wireless providers with large rural service areas joined the map and included their expanded service, other mobile wireless providers refined their service areas and added new and faster 4G service boundaries, and a point-to-point microwave provider with powerful chain of towers was added to the map. For more detailed wireless broadband maps, see Appendix B.

Traditionally underserved areas of the state, including tribal land, also saw increased public and private investment. At least two tribes, the Confederated Tribes and Bands of the Yakama Nation, and the Quinault Indian Nation, began constructing their own broadband networks. The Confederated Tribes of the Colville Indian Reservation plan to leverage their recently awarded federal broadband grant into job and business opportunities for their tribe long after the infrastructure is in place.

Infrastructure was part of what researchers considered when giving Washington top marks for its broadband-enabled economy. Among the studies that put the state near the top of national ranking are:

- 2012 TechNet State Broadband Index – ranked Washington number one for broadband adoption, network quality, and economic structure.
- The Geography of the Apps Economy Report – ranked Washington number two for the number of apps economy jobs and first in the nation for "apps intensity" (the number of apps jobs as percent of all jobs in the state).
- TechAmerica 2011 Cyberstates Report – ranked Washington first in software publishing and first in high-tech wages compared to private sector wages in the state.
- 2012 State New Economy Index – ranked Washington third in the nation for the attributes necessary to an innovation and entrepreneurial economy. These include a workforce and jobs based on higher skills; strong global connections; dynamic firms, including strong, high-growth startups; industries and individuals embracing digital technologies; and strong capabilities in technological innovation.





Researchers working on the TechNet Broadband Index identified common characteristics among states that had high index scores. Those characteristics are executive and legislative leadership, cooperation among stakeholders, and broadband planning. Washington's private and public sectors have leveraged all of these characteristics and the result of their work is reflected in this report.

The Washington State Broadband Office of the Washington State Department of Commerce (Commerce) builds on those characteristics and works toward retaining or improving the state's competitive edge through coordination, programming, and outreach on broadband issues in the state. The Broadband Office also supports broadband deployment and adoption activities. As part of that mission, the Broadband Office continued to work with Sanborn, the mapping vendor, to improve the Washington State Interactive Broadband Map in 2012. The map is updated every six months with data from more than 100 Washington broadband providers. The Broadband Office also launched two initiatives in 2012 that are designed to strengthen the state's competitive advantage.

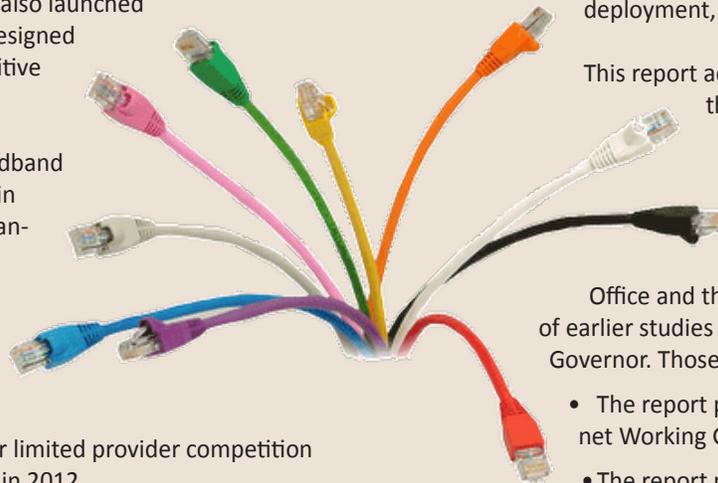
In the summer of 2012, the Broadband Office awarded nearly \$300,000 in grants to five local technology planning teams. Winning applicants demonstrated how they would assess community broadband needs and plan for solutions to those needs. The grantees are working in communities that still show the slow network speeds or limited provider competition despite the substantial build-out in 2012.

The Evergreen Apps Challenge also was launched in 2012. The contest was a joint effort of the Broadband Office, the city of Seattle, and King County government. Evergreen Apps challenged the region's many talented developers to design apps that used

public data for the common good. Winning applications ran the gamut from crowdsourcing on election issues to making restaurant health inspections available on the go. Six application development teams took home more than \$76,000 in prize money.

This is the Broadband Office's third annual report. Our annual reports are required by legislative mandate to include at least the following information:

- The geographic areas of greatest priority for the deployment of advanced telecommunications infrastructure in the state.
- A detailed explanation of how any amount of funding received from the federal government for the purposes of broadband mapping, deployment, and adoption will be or has been used.
- A determination of how non-federal sources may be utilized to achieve the purposes of broadband mapping, deployment, and adoption activities in the state.



This report additionally provides a picture of the state's broadband ecosystem and is based on data collected for the state broadband map, recent scholarship and analysis, and publicly available data.

The creation of the Broadband Office and the annual reports build on the work of earlier studies done on behalf of the state and the Governor. Those studies include:

- The report published by the High-Speed Internet Working Group in 2008.
- The report published by the Governor's Broadband Advisory Council in 2009.
- The first report of the Broadband Office published in 2010.
- The second report of the Broadband Office published in 2011.



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January 15, 2013

Governor Inslee, Senator Eriksen, Representative Morris

As provided in law (RCW 43.330.421), the Broadband Office of the Washington State Department of Commerce convened an advisory group on digital inclusion and technology planning in 2012. The advisory group includes the undersigned volunteer representatives from community technology organizations, broadband providers, higher education institutions, broadband policy experts, state, local and tribal governmental entities that are engaged in community technology activities.

We, the undersigned, are pleased to present the following recommendations to the Governor and the Legislature selected policies to improve the deployment and adoption of high-speed Internet services and the strategic inclusion of technology advancements and technology education. These steps are critical to ensuring that Washington remains competitive and continues to provide a skilled workforce, attract businesses, and stimulate job growth.

Handwritten signatures of Bill Gillis, David Keyes, Marlon Shafer, Dan Youmans, Dale Merten, Rhonda Weaver, Mike Crandall, Monica Babine, Mike Doherty, Mary Verner, Doug Mah, Greg Marney, and Wilford Saunders.

- Bill Gillis**, VisionTech360
- David Keyes**, Communities Connect Network
- Marlon Shafer**, Odessa Office Equipment
- Dan Youmans**, AT&T
- Dale Merten**, Toledo Telephone
- Rhonda Weaver**, Comcast
- Mike Crandall**, University of Washington
- Monica Babine**, Washington State University
- Mike Doherty**, Clallam County
- Mary Verner**, Spokane Tribal Enterprises
- Doug Mah**, Office of Financial Management
- Greg Marney**, NoaNet
- Wilford Saunders**, Department of Commerce



Broadband Advisory Council Recommendations

The state’s public sector workspaces should continue to evolve into the 21st century. That evolution should include adopting and utilizing broadband networks and services citizens need and want. This means:

Adopt best digital practice: Government services ranging from citizen education, to permitting applications, to payment, can be and are being accomplished online by government agencies and their private partners. We can save time and money, and improve online services if we plan for the access and digital needs of disadvantaged citizens and facilitate interactions with government through a common online portal.

Enable a 21st century work strategy: The state should develop and adopt a workplace strategy that will identify and support workplace solutions that are mobile, collaborative, flexible, functional, and increase productivity.

Continue Washington’s leadership in digital education: Broadband services can help our schools and colleges deliver a more diverse curriculum for a broader spectrum of student needs at a lower cost. State programs should encourage integration of broadband services across the entire K-20 spectrum and connect with libraries and community learning centers as partners in life-long education.



From first responders, to libraries, to business development, Washington should encourage collaboration in the planning, deployment and utilization of new networks and new services to promote sustainable success among Washington’s communities and businesses. This means:

Encourage and reward public-private partnerships. Projects that effectively demonstrate a significant degree of consultation between and among public entities, private entities, or a mix thereof should receive a higher priority for funding opportunities than isolated proposals with a more limited or singular purpose.

Expand and improve local technology planning teams. Washington has a long-standing commitment to support local community technology efforts within economic development planning. Sustainability and government efficiency is best achieved by seeking opportunities to maintain and grow the local public-private partnerships that enable local communities to resolve problems, deliver services and jump start jobs.

Promote efficiency in the delivery of public safety. By leveraging existing private and public broadband network investments we can improve the efficiency, extent and effectiveness of interoperable public safety communication throughout the state.

Encourage the development of training and support along with infrastructure. Washington is and must remain a leader in integrating technical support, basic and advanced digital training with the deployment of broadband infrastructure. As federal programs conclude, the state should return to funding a Community Technology Opportunities Program.



The state should pursue all appropriate opportunities to eliminate regulatory and other barriers to private investment to support Washington's future as a leader in the digital economy and a broadband champion. This means:

Pursue opportunities to streamline the permitting process. Private provider investment can be encouraged by streamlining permits and right of way applications, establishing time frames to guide permit processes, supporting new approaches like de minimis change waivers and model ordinances to promote consistency among government permitting processes.



Establish policies that reduce the need for duplicate trenching. Costs are reduced and efficiency is improved by promoting multi-purpose public projects that consult with providers, share open trenches, and jointly use conduit.



Introduction

The year 2012 began and concluded with a flurry of broadband activity in Washington State. Federal grants funded the construction of hundreds of miles of fiber optic broadband, the last of three years of broadband adoption work, and the creation of community-based broadband planning teams (for an explanation of broadband terms see the Guide to Terminology on page 30). It also was the inaugural year for an apps contest that encouraged the use of public data for the common good.

Those developments and other trends in the broadband ecosystem are presented in the Washington State Broadband Office's third annual report. This report, and the collection and validation of broadband service information every six months for the state broadband map¹ and the National Broadband Map,² has been made possible by the support of the Washington State Legislature, the National Telecommunications and Information Agency, and broadband providers across the state.



The State of the State's Broadband

A Year of Change for Broadband in Washington

Ryan Jepperson is a senior software engineer with Microsoft. He and his wife, Christina, lived in Seattle where access to broadband is nearly ubiquitous, with multiple provider and technology options in most neighborhoods. But after the couple had a son and a daughter, Jepperson wanted them to grow up in the neighborhood where he was raised near Lyman, a small community in Skagit County.

The move allowed the family to start a herd of polled Hereford cattle, raise chickens, and get involved in their community. But the cost was drastically reduced access to broadband. Videoconferencing with other software engineers abroad was next to impossible with a satellite connection that delivered 0.2 Megabits-per-second (Mbps). Jepperson's wife, an emergency room nurse at Harborview, was getting ready to begin graduate school and was worried about her ability to take online classes with such limited bandwidth. And the couple was worried about their children's future as well because their elementary school had no connectivity at all.

Jepperson began researching solutions. He wrote applications for grants, talked to the local public utility district about funding their own broadband project, and recruited friends and neighbors to his cause.

The solution to Jepperson's bandwidth dilemma came from an unexpected source. As part of a merger agreement, Frontier Communications committed to \$40 million in network investments in the state. That investment included better broadband service to Jepperson's house. In the fall of 2012 he was subscribing to Frontier's newly upgraded service at 2.2 Mbps download and 0.7 Mbps upload. Then Wave Communications delivered on earlier commitment to the community, and now provides service to Jepperson's house with download speeds of 18 Mbps. The local PUD also plans to provide a fiber-optic connection to Lyman Elementary School before March 2013.



"The combination of the two new services allows me to work effectively, which is a major relief," Jepperson said.

Stories like this were repeated all over Washington State in 2012 as the bulk of more than \$308 million in public and privately funded broadband infrastructure projects were in full swing.



Mapping Data Tells the Story

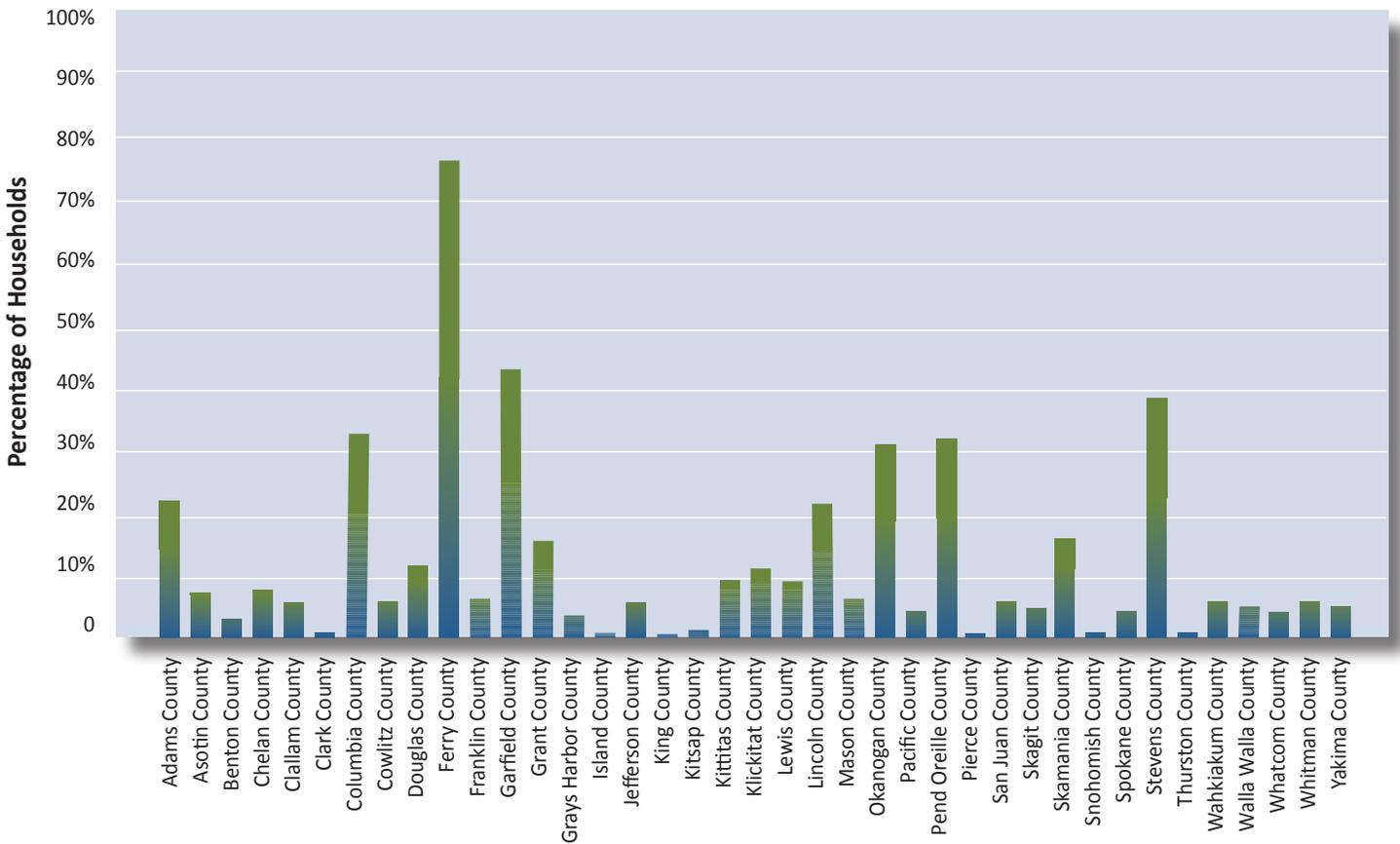
The results of the new infrastructure are showing up in communities across the state. Washington has 629 unique census “places” that include incorporated cities and towns, and some unincorporated, often rural, communities called Census Designated Places. Of these 629 places more than 500 saw an increase in the broadband speeds available in 2012. Those increases were due to expansion or improvement of wireline broadband, wireless broadband or both, according to data collected by Sanborn, the mapping vendor for the Broadband Office. This analysis is based on information reported by 113 broadband providers to Sanborn.

Washington ranks 10th in the nation for percent of the population (98.7 percent) with access to 3 Mbps or better download, according to the National Broadband Map.³ The state is 19th in

the nation for population with no access to a broadband provider, although that is true for only 0.1 percent of Washington residents.⁴ Washington residents still have more choices for broadband service than most, with 35.3 percent of the population in the service area of three providers, compared to 30.5 percent nationally. In addition, 55 percent of the state’s population has access to wireless service from five providers, while nationally only 26 percent of the country’s population has that many choices.⁵

As a result of this build-out, the number of households with access to no provider at all has decreased. There are however, still some parts of the state that are unserved. Ferry County in North Central Washington, for instance, is sparsely populated and has miles of rugged terrain. In that county, 77 percent of the households still do not have access to a wireline broadband provider. Other counties fared better as is seen in Figure 1.

Figure 1
No Wireline Providers Available - October 2012





Federal Funding Supports New Infrastructure

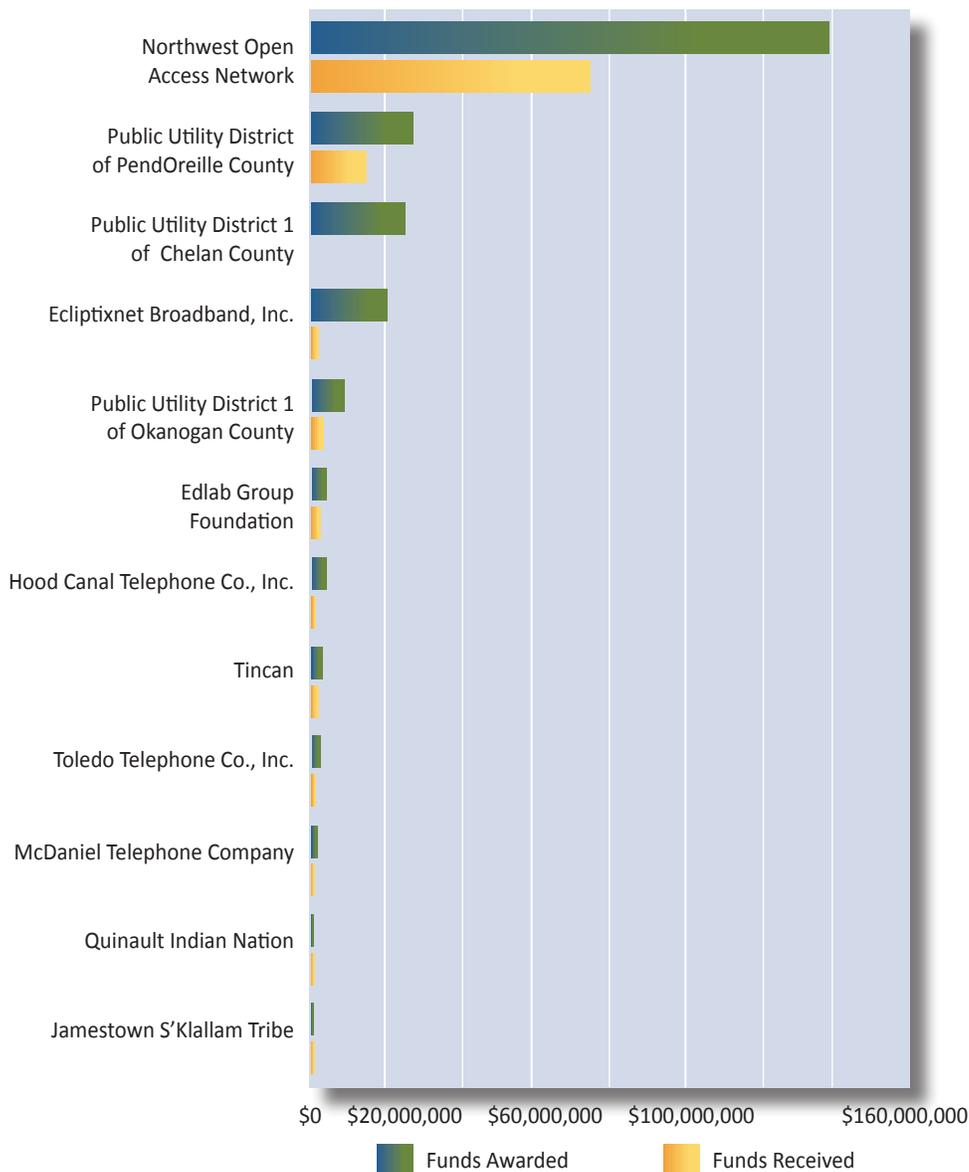
A significant portion of the state’s new broadband capacity wouldn’t have been possible without the work accomplished with grants and loans under the American Recovery and Reinvestment Act of 2009.⁶ Direct federal investment in infrastructure, public computing centers, and adoption programs came through two federal agencies.

The National Telecommunications and Information Agency administered the \$4.7 billion Broadband Technology Opportunity Program (BTOP)⁷ and the U.S. Department of Agriculture administered the \$3.2 billion Broadband Initiatives Program (BIP) through

its Rural Utilities Service.⁸ Both programs had short deadlines for their related broadband projects. Award recipients in most cases had to be substantially complete within two years of the grant award, and complete in three years. Much of the money awarded to Washington recipients was awarded in 2010, so 2012 was a very busy year for broadband in the state.

Figure 2 shows how much money each of the BTOP and BIP grantees were awarded, and how much they have received as of September 2012.

Figure 2
BTOP and BIP Awards & Expenditures in Washington through Q3 2012



BTOP Invests in Washington

The National Telecommunications and Information Agency awarded more than \$165 million to public and private entities for Washington infrastructure projects. The largest award (\$140 million) went to the Northwest Open Access Network (NoaNet),^{9,10} a nonprofit, open-access broadband network formed by several Washington public utility districts. When complete, NoaNet's broadband project will connect up to 600 anchor institutions, 200 more than originally planned, as the project budget and schedule allow. In 2011, NoaNet broke ground on the construction project with more than 1,300 approved miles of fiber. Nearly 800 miles of fiber were expected to be complete by December 2012 and the remaining 550 miles will be done by August 2013, according to NoaNet.

More information on the project's progress is available at the NoaNet website.¹¹

In June 2011, Pend Oreille Public Utility District (PUD) No. 1¹² began construction on its fiber-to-the-premises project that could eventually span 740 miles, depending upon the number of customers that consent to having the fiber brought to their premises. The potential is to provide wholesale broadband access to approximately 5,000 households, 360 businesses, and 24 community anchor institutions.

Through the end of the third quarter of 2012, the PUD installed more than 380 miles of fiber including 900 "drops" to individual premises and has just launched an installation contract for 2,000 more plug-n-play service drops. Along with a 20 percent match, the BTOP grant for \$27.2 million will fund the \$34 million project. The project will be complete and operational by March 2013.

Figure 3
NoaNet Broadband Construction



Map of completed and planned broadband routes in Washington State. Source: NoaNet



Broadband Initiatives Program Puts Infrastructure in Rural Washington

Washington BIP applicants were awarded \$49 million in funding by the U.S. Department of Agriculture (USDA) and many have already begun work. The largest award (\$25 million) was made to Public Utility District No. 1 of Chelan County for a major fiber deployment project, but commissioners voted to cancel the project and declined the award.¹³

Ecliptixnet Broadband got the second largest award (\$14.3 million) for construction of a fixed and mobile wireless broadband network¹⁴ that, when completed, will provide access to 90 percent of the rural properties in Ferry, Stevens, and Spokane counties. Ecliptixnet spent \$970,770 of the award and has begun construction on the first of 18 new tower sites and completed site acquisition and local permitting on 15 of the 49 planned project sites, according to the company's most recent report on Recovery.gov.

Hood Canal Telephone was awarded \$2.7 million for broadband infrastructure¹⁵ in Mason County. The company completed an eight-month permitting process in December 2011 and had begun construction by mid-2012, but the project was less than 50 percent complete at that time.

McDaniel Telephone Company¹⁶ in Salkum reported in 2011 that it had begun work on its project to improve digital subscriber line (DSL) broadband in its service area, but to date the company has not expended any of the \$1.2 million it was awarded.

Public Utility District No. 1 of Okanogan County¹⁷ reported that it has spent \$2.3 million of its \$5.5 million award, and a contract for telecommunications construction has been awarded to a bidder. In September 2012, the PUD was still waiting on contract approval by the USDA and a final environment approval by the Washington State Department of Natural Resources. When complete, the project will leverage an existing fiber backbone by adding wireless access points and provide high-speed broadband access to more than 6,000 homes in the organization's service area that currently lack such access.



Okanogan County

Federal Funds Awarded After the Recovery Act

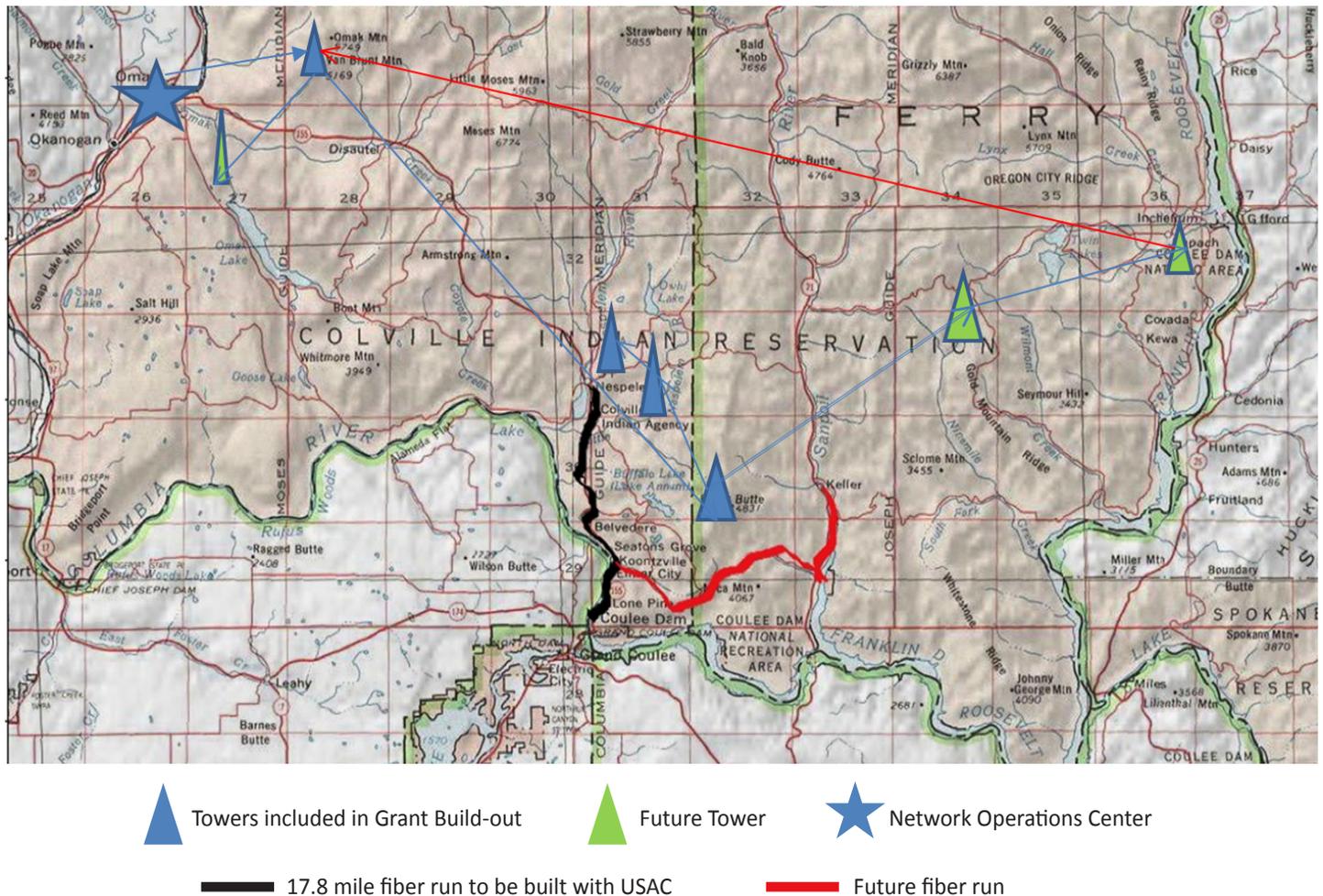
Federal broadband investment continues in Washington State. In October 2012, the Confederated Tribes of the Colville Indian Reservation was awarded a \$1.3 million Community Connect grant. The funds will be used to provide broadband services to the rural community of Keller through an optical fiber-fed wireless access network. Additionally, the community center will be equipped to provide free access to computing equipment, training, and broadband services to residents for at least two years.

“We hope to have all the permitting done by March,” said Susie Allen, project manager for the tribe. And the tribe expects to make substantial progress on the project in 2013. “We should have the fiber runs done by the end of June.”

The grant money and the fiber run that results from it are part of a larger plan for the tribe, according to Allen and Jim Ronyak, information technology director for the tribe. Before the fiber goes in the ground Allen and Ronyak hope to establish a tribally sanctioned information technology school and train tribal members on installation and operation of the broadband network. They plan to hire as many as 30 of those students as employees in the construction phase, which is scheduled to begin in the spring. Graduates of the school will have the opportunity to apply for the computer center positions funded by the grant, Ronyak said.

Once the tribe’s beefed up infrastructure (a combination of fiber and wireless technologies) is in place, Ronyak and Allen hope to establish business partnerships that will eventually result in a call center and revenue-sharing agreements. All told, they expect these partnerships to create more than 60 new jobs on tribal land.

Figure 4
Confederated Tribes of the Colville Indian Reservation Broadband Plan



Private Investment Tops Federal Dollars

In addition to public funding in 2012, private investment in broadband infrastructure continued at a brisk pace. CenturyLink upgraded service in many communities in the state through technology improvements, such as installing fiber to neighborhood distribution hubs that improve broadband to homes. Frontier

made similar upgrades to its equipment in rural communities, such as Malden, a town of 200 residents in Eastern Washington.¹⁸ Verizon and AT&T continued to add to their inventory of 4G communities in the state. And Wave Communications began upgrading legacy cable TV networks in Seattle acquired with its purchase of Broadstripe.

Figure 5
Private Broadband Investment in Washington

Company	Amount Invested	Time Period	Reason
Frontier Communications	\$40 million ¹⁹ (\$27 million in 2012)	2010 to September 2012	Agreement as part of merger with Verizon Northwest in 2010
CenturyLink	\$80 million	2011 to present	Agreement as part of merger with Qwest in 2011
AT&T	\$1.5 billion	2009 to 2011	Investment in wireless coverage and speed
Verizon Wireless	\$208 million	2010 to 2011	Infrastructure additions and upgrades
Comcast	\$4 billion	1996 through 2011	Infrastructure additions and upgrades
Wave Communications	\$1 billion in West Coast states ²⁰ Beginning in 2012		Expand broadband business





More Than Infrastructure Is Needed to Make Network Valuable

The results of public and private investments in broadband in 2011 and 2012 are shown on the state's interactive broadband map on the Washington State Broadband website.²¹ The 2012 State New Economy Index²² recognizes these investments and improvements, and ranks Washington eighth in the nation, up from 15th in 2010. But having access to service is only part of the equation for unleashing the full potential of broadband. Economic, educational, and quality of life benefits only come with adoption – the subscription to broadband and use of the service at home, at work, or on the go. And the work towards adoption cannot stop at its most basic level with just email and Web surfing.

Here's what we already know about broadband adoption in Washington. Nationally, about 66 percent of all adults have an Internet connection at home.²³ State-level data about home use, however, is harder to come by and produces some mixed results.

For example, subscriber data gathered by the Federal Communications Commission as of June 30, 2011, shows a subscriber ratio (broadband in the home) of 51 percent²⁴ with connections of at least 3 Mbps download and 768 Kbps upload. That subscriber ratio makes Washington 10th in the nation for subscribers at that broadband speed and ahead of all but four of our competitor states (see Figure 6). Competitor states Massachusetts, Maryland, Virginia, and Colorado are ranked second, fourth, fifth, and ninth respectively.



Nationally, about 66 percent of all adults have an Internet connection at home.

Figure 6
Residential Fixed Connections and Households by State as of June 30, 2011
 (Approximating the National Broadband Availability Target)

State	Connections	Households	Subscriber Ratio
New Jersey	2,317	3,192	0.73
Massachusetts	1,762	2,568	0.69
Delaware	226	343	0.66
Maryland	1,403	2,158	0.65
Virginia	1,725	3,052	0.57
District of Columbia	150	270	0.55
New Hampshire	279	513	0.54
Vermont	133	248	0.54
Colorado	1,056	1,978	0.53
Washington	1,393	2,615	0.53
Connecticut	696	1,358	0.51
Pennsylvania	2,524	4,927	0.51
New York	3,521	7,339	0.48
Oregon	731	1,522	0.48
Utah	424	894	0.47
California	5,565	12,634	0.44
Texas	2,508	8,977	0.28
Idaho	100	575	0.17
North Carolina	495	3,737	0.13
National Average			0.38

Connections with advertised speeds at least 3 Mbps down and 768 Kbps up and households, in thousands. Shaded rows represent competitor states.



However, data teased out of the 2010 Census and released in July 2012, shows that 83.6 percent of the state’s population lives in households with Internet access,²⁵ making Washington third in the nation for Internet in the home. Only New Hampshire and Utah report higher rates for Internet in the home.

But having a computer with Internet access in the home does not mean it is being used by everyone in the home. Family members may lack the necessary skills to use the computer or broadband services. However, in Washington that is not often the case. The state also had the third highest percentage of individuals accessing the Internet at home (73.8 percent), trailing New Hampshire (76 percent) and Connecticut (74.1 percent).



Washington residents also like to access the Internet from places outside the home. Just over 45 percent of state residents over the age

of three access the Internet outside their home. Only six other states have higher rates of Internet use outside the home. And in late 2011, a study²⁶ conducted by the National Telecommunications and Information Agency in conjunction with the U.S. Census Bureau determined that Washington State had the third highest adoption rate in the nation. And unlike some other regions of the country, the difference in adoption between urban and rural areas was only 9 percent.

The 2012 New State Economy Index²⁷ ranked Washington as third in the nation for percentage of the population using broadband at 86 percent, up from 88.4 percent in 2010. Utah was the only competitor state with a higher percentage of its population online.

Figure 7

Demographics of Internet users

Below is the % of each group of American adults who use the Internet, according to our August 2012 survey. For instance, 85% of women use the Internet.

	% who use the Internet
All Adults	85
Men	85
Women	85
Race/Ethnicity	
White, Non-Hispanic	86
Black, Non-Hispanic	86
Hispanic (English and Spanish speaking)	80
Age	
18 - 29	96
30 - 49	93
50 - 64	85
65+	58
Household Income	
Less than \$30,000/yr	75
\$30,000 - \$49,000	90
\$50,000 - \$74,999	93
Educational Attainment	
No High School Diploma	61
High School Grad	80
Some College	94
College +	97

Connections with advertised speeds at least 3 Mbps down and 768 up and households, in thousands. Shaded rows represent competitor states.



Despite these statistics, there are still populations that need more assistance to become confident broadband adopters, and take full advantage of this important tool's potential. Low-income and elderly Americans, and those with limited English skills or a disability have persistently lagged behind in broadband adoption when it is measured as having broadband in the home. However, smartphones that enable Internet access are helping close that gap. The Pew Internet and American Life Project found significant increases in Internet use by cell phone between 2009 and 2012 among low-income and minority consumers, as well as those adults with an education level of high school or less.²⁸



The credit for some of the increases in broadband adoption in Washington State belongs to the work of community technology organizations – nonprofits and local government units focused on reaching underserved communities. Many of those organizations are in the final year of a three-year grant from the National Telecommunications and Information Agency under BTOP.

Figure 8
Changes in Cell Phone Internet Use by Demographic, 2009 - 2012

	April 2009	April 2012	Change
All Cell Owners	31%	55%	+24 % points
Men	35	57	+22
Women	27	54	+28
Age			
18 - 24	45	75	+30
25 - 34	43	80	+37
35 - 44	38	68	+30
45 - 54	28	53	+25
55 - 64	17	30	+13
65+	7	16	+9
Race/Ethnicity			
White, Non-Hispanic	27	52	+25
Black, Non-Hispanic	44	64	+20
Hispanic	44	63	+19
Household Income			
Less than \$30,000/yr	26	50	+24
\$30,000 - \$49,000	31	52	+21
\$50,000 - \$74,999	29	60	+31
\$75,000+	43	69	+26
Educational Attainment			
Less Than High School	28	45	+17
High School Grad	24	49	+25
Some College	35	57	+22
College +	36	64	+28
Geographic Location			
Urban	30	62	+32
Suburban	25	56	+31
Rural	17	44	+27

Source: Pew Research Center's Internet & American Life Project, March 15 - April 3, 2012. Tracking survey. N=2,254 adults ages 18 and older, including 903 interviews conducted on respondent's cell phone. Margin of error is +/-2.6 percentage points based on cell phone owners (n+1,954). 2009 data based on March 26 - April 19, 2009 tracking survey. N=2,253 adults ages 18 and older, including 561 interviews conducted on respondent's cell phone.

Working Towards Adoption and Creating Computing Centers

The EdLab Group was awarded \$4.1 million in BTOP funding for the development of public computing centers in 11 counties across the state. The centers provide broadband access and skills training for groups and communities that historically have had low broadband adoption rates. EdLab used the grant to create the Communities Connect Network Project. The project is investing in direct resident services, enhanced technology, and program capacity building for community institution partners in the public and non-profit sectors. EdLab Group worked with 22 sub-recipients, including organizations as diverse as Helping Link, which serves the Vietnamese community, Horn of Africa Services, and the Puyallup Public Library. A state directory of public computing centers and learning resources was published at www.communitiesconnect.org.

By end of the second quarter 2012, Communities Connect had delivered 199 new or replacement workstations to its sub-recipient's centers.²⁹ Six public computer centers received updated broadband connectivity, 11 centers got new broadband wireless connectivity, and 419 additional hours of access to public computer centers were added weekly as a result of BTOP funds.

The funds also made possible a variety of training programs, including basic Internet and computer use, office skills, English as a Second Language, and college preparatory classes. To date, the computer centers supported by the grant have delivered more than 21,000 hours of training on these topics.

Because of its work with the EdLab Group, the Kalispel Tribal Court system installed a videoconferencing system for participation in hearings. Additionally, the court system added three Public Law and Justice Computing Centers, making it easier to use the tribal court system. The court system's centers are catching on – there was a more than 400 percent increase in the number of clients using their new center between the first and second quarters of 2012. The tribal court system celebrated success at an event attended by state officials, including the Broadband Office, and featured a video appearance by a representative of the National Telecommunications and Information Agency.³⁰

The EdLab Group also completed an assessment process with researchers from the University of Washington and worked on developing a plan for sustaining their work after the grant concludes.

One Economy received \$28 million for Sustainable Adoption programs in 60 cities and towns nationwide. Seattle and King County were locations identified in their nationwide grant.

One Economy's installation of free and low-cost broadband in public housing was delayed, but is expected to be complete in 2013. One Economy will also conduct training for Community Technology Associates to maintain the network and train residents on use of the Internet. Nationwide, the organization trained 2,823 youth and 198 instructors trained for Digital Connector programs, which in turn provided digital literacy training to nearly 220,000 program participants.

The Inland Northwest Community Access Network (Tincan) in Spokane is in the process of closing out its \$1.2 million grant for development and support of Public Computer Centers,³¹ and just more than \$980,000 to support Sustainable Adoption programs.³² By November of

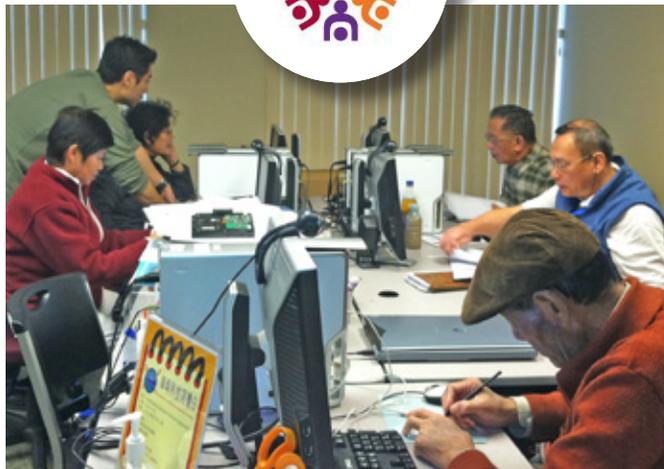
2012, Tincan had facilitated installation of 305 new publicly accessible workstations in the region and was reporting an average of 5,183 users per week. Seven of the computing centers in the project received upgraded broadband connectivity through the grant. Training continues to expand through the adoption grant and it has resulted in at least 214 new broadband subscribers.

Toledo Telephone was awarded \$2.1 million for its Sustainable Adoption³³ program. Toledo Telephone's project offers discounted broadband service and a loaned laptop to participants who complete a basic digital literacy course, also provided by the company. By June 2012, the company had engaged 538 participants and added 433 new broadband subscribers. Among their outreach strategies were door-to-door canvassing, and adding customized computer classes at the request of program participants.

Zero Divide received \$1.3 million for its multi-state Sustainable Adoption³⁴ program. Zero Divide identified King, Snohomish, Pierce, Skagit, and Island counties as their areas of focus in Washington State. In the third quarter of 2012, Reel Grrls Productions, a program of Zero Divide, completed five youth-created media projects for four client organizations: Washington Bus, Yoga Behind Bars, Women in Innovation, and Within Reach. The content is shared on client websites and social media platforms, and is integral to each organization's online presence.

EdLab Group, Toledo Telephone, and other federal broadband grant recipients participated in quarterly meetings of the state's Council on Digital Inclusion during 2012 to share broadband adoption strategies and research and leverage partnerships.

EdLab Group



Important History and Uncertain Future

Many of these programs had their genesis in the Community Technology Opportunity Program³⁵ (CTOP) which was created by the Legislature in 2008 to support and advance community technology programs that provide “digital inclusion” activities for Washington’s underserved and low-income residents. Washington State University Extension (WSU) was named administrator of this program.

CTOP has been seen as a national model for community-based adoption programs. CTOP was only funded for one year, and all of the sustainable adoption programs funded under BTOP had grants that ended in December 2012. Finding a source of sustainable operational funding has been difficult for these programs. In the meantime, libraries, schools, and community centers have unused capacity in the form of fast broadband connections and upgraded computer equipment. Additionally these same organizations may be at risk for losing employees trained to teach a full range of computer literacy skills to population groups that are often the hardest to reach.

State-Level Clearinghouse and Coordination

In order to help states coordinate the work of broadband build-outs and broadband adoption, the same federal agency that awarded American Recovery and Reinvestment Act money for adoption and computing centers also awarded State Broadband Initiative funding to designated entities in all 50 states and the U.S. territories. In Washington State that entity is the Broadband Office.

The total federal funding for the program’s five-year grant is \$7.3 million, administered by the National Telecommunications and Information Administration (NTIA) through the Broadband Technology Opportunities Program (BTOP). Since its inception in 2010, the Broadband Office has been responsible for launching and maintaining an interactive map³⁶ of broadband availability in the state and publishing annual reports on the state of the state’s broadband network.³⁷

In 2012, the Broadband Office launched and/or strengthened three initiatives designed to increase broadband access and adoption.

Communities Shaping Their Own Future

Washington communities are diverse and their broadband capabilities and needs are diverse as well. Each lies along a continuum, a kind of progress scale starting at unserved communities and extending to digital destinations that have become hothouses for innovation. For a more extensive explanation of this scale, see Appendix B.

The Broadband Office supports planning as a key to successful improvement anywhere along the scale. That belief in the importance of local planning goes back to the 2008 report of the High-Speed Internet Working Group and was reaffirmed in the recommendations of the Governor’s Broadband Advisory Council in 2009. The council’s report encouraged local governments or coalitions of local governments to determine and attempt to fund their own proposals for broadband deployment. Since its inception, the Broadband Office has been advocating for broadband as a part of community planning at workshops, planner’s forums, and within Commerce.

During 2012, the Broadband Office conducted the first of two annual cycles of grant funding, awarding nearly \$300,000 to five local technology planning teams. The teams were chosen from a field of 16 applicants representing 17 counties and three tribes with requests totaling more than \$900,000.

Programs such as La Casa Hogar submitted concepts that fit their community’s needs. La Casa Hogar serves a primarily Spanish-speaking population in Yakima. They provide service out of a refurbished home on a quiet street. But the tidy exterior doesn’t reflect the flurry of activity that takes place inside.

Programs offered at La Casa Hogar include: English as a Second Language classes, Spanish Literacy classes, Adult Basic Education classes, a clothing bank, leadership training, parent education, a children’s learning center, and computer and technology training.

La Casa Hogar’s focus on children and technology became the heart of their grant request as a local technology planning team.

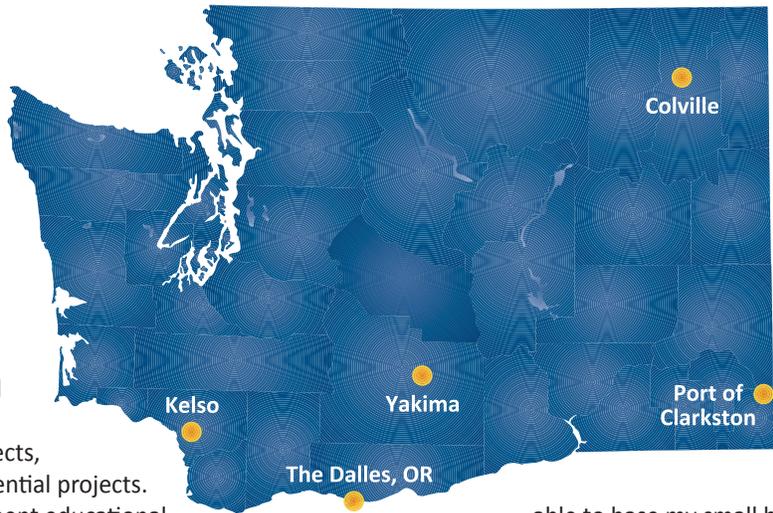




As a result, **Yakima Interfaith Coalition – La Casa Hogar** was awarded \$63,920 for a project that includes a broadband-adoption needs assessment for licensed child care businesses in Yakima County. Most of the child care businesses are home-based, and many of them are run by caregivers with limited English skills and education. The team will study these and other barriers to adoption, then develop digital inclusion strategies and a resource plan based on their findings.

The other four local technology planning team grant recipients were:

The Port of Clarkston, which was awarded \$46,232 to develop a telecommunications plan for Asotin County that includes broadband education and application development strategies, “Last Mile” connectivity solutions, preliminary engineering and construction cost estimates, organizational and operational recommendations for future network implementation projects, and funding strategies for potential projects. The team also plans to implement educational activities identified as top priorities by the community.



Cowlitz-Wahkiakum Council of Governments, which was awarded \$72,000 to conduct a needs assessment, gap analysis, and economic impact study for expanding broadband capabilities for economic development, public safety, tourism, research, and educational opportunities in Cowlitz and Skamania counties around the Mount St. Helens National Monument.

The Mid-Columbia Economic Development District, which was awarded \$69,600 to conduct a community and business needs assessment, and confirm unserved and underserved areas of Klickitat and Skamania counties. In addition, the new team plans to increase community awareness of broadband and identify educational and skills development needs.

Backed by the grant to the Mid-Columbia organization, the Klickitat Skamania Local Technology Planning Team was formed and includes Community Enrichment for Klickitat County and Washington State University Extension. The team held its first committee meeting in September 2012. By early November, the team had completed 10 community forums and one chamber presentation, and developed and distributed broadband surveys. Approximately 160 residents from the two counties participated in forums to learn about the team, discuss the importance of broadband, and provide input to the project.

The surveys gathered information from 78 businesses and 280 residents. Findings will be used to help with next steps, such as additional identification of broadband needs, community outreach, and training. This comment from one survey respondent reflects some of broadband’s potential for residents of these two rural counties:

“...I would be able to work from home if I had reliable Internet access. I would be able to base my small business in Klickitat County and bring much needed jobs into the local labor market.”

The Tri-County Economic Development District, which was awarded \$48,224 to organize a local technology planning team in Stevens County in partnership with WSU. The team will identify community barriers and opportunities to increase broadband access and adoption. The team will develop a plan that links to the state’s broadband strategy and will research the Early Digital Literacy program as a possible adoption strategy.

A second, similar round of funding is expected to be available in April 2013, as local broadband planning has been important to the state in the past and will continue to be important to our future.



Bonneville Dam, Washington

Apps Contest Encourages Public Data Use for Common Good

During 2012, the Broadband Office launched the Evergreen Apps Challenge³⁸ in partnership with the city of Seattle and King County. The goal of the contest was two-fold: to drive demand for broadband through applications, and to increase the amount and use of open data sets from government. Contest activities included a 54-hour hackathon for civic apps developers – the first “Startup Weekend Gov” event in the nation. The April 2012 event not only kicked off the contest, but also gave developers three days to begin work on applications that used public data sets from the state, King County, and the city of Seattle.

The contest garnered media coverage from the state’s largest newspaper, The Seattle Times, as well as community newspapers, such as the Kitsap Sun and Geekwire, the online source for technology news. The apps contest also was featured in the National Governor’s Association Center for Best Practices newsletter.⁴⁰

All told, the contest drew applications from 20 finalists. Winners of the contest, which had more than \$75,000 in prizes, were announced at a ceremony in Seattle City Hall in October. Winners included applications that helped with crowdsourcing election issues, navigating the public transit system, planning around

Seattle’s infamous rainfall, and checking food inspection reports for nearby restaurants.⁴¹

The contest had benefits that went beyond getting capital in the hands of start-up companies – the Broadband Office had the opportunity to form new relationships among broadband stakeholders. Idea Scale, a locally developed program, was used to collect application ideas. Boingo, a Wi-Fi company, donated free Wi-Fi connectivity for an application development event planned for a Washington State Ferry. Washington-based defense contractor, Applied Technical Services, sponsored an event for developers in Bremerton, and Seattle-based Geekwire was a media partner, spreading contest information throughout the tech community.

The contest also was made possible by the creation of a new Washington State Geospatial Portal.⁴² The portal serves as a single, vetted source for mapping information on everything from sales tax rates for every town in Washington to the location of the nearest boat ramp. Since the portal was made public, the Broadband Office has encouraged other state agencies to add their information to the site or share data with the state’s other open data portal, data.wa.gov.



Collaboration Continues with Council

During 2012, the Broadband Office strengthened its existing partnership with the Washington State Council on Digital Inclusion.⁴³ The multi-sector Council was created by the Communities Connect Network and shares many of the goals of the Broadband Office, including “coordinating programs and investments; analyzing research and data; establishing priorities and strategies for state, private, and community efforts; sharing challenges, needs, best practices and resources; and creating partnerships.”

The Broadband Office has participated in and hosted Council meetings. Council members served on the local technology planning team grant review group and on the Broadband Advisory Council, which was convened in 2012.

Washington’s leading technology industries use the most sophisticated tools and opportunities provided by broadband. A skilled and educated workforce is the best way for Washington to support and continue growth of our innovation economy. A coordinated state broadband strategy would address issues such as broadband adoption, public access to broadband, and incorporating broadband into our education and healthcare systems.

While the Broadband Office had a statewide focus, there were also some important changes affecting broadband that came from policymakers working at the federal level in 2012.

Permitting and Regulation Policy Changes

President Barack Obama led the way with a permitting policy change in June 2012 with his “dig once” executive order.⁴⁴ The document creates a committee charged with making permitting for broadband infrastructure simpler and more consistent across federal lands and federal facilities. The goal is that federal agencies “develop and implement a strategy to facilitate the timely and efficient deployment of broadband facilities on federal lands, buildings, and rights of way, federally assisted highways, and tribal lands.”

The federal government owns about 30 percent of the land in the United States, and 28.5 percent of the land in Washington is federal.⁴⁵ That federal land includes huge swaths managed by the Bureau of Land Management, Forest Service, Fish and Wildlife Service, National Park Service, and the Department of Defense. Transparent and consistent permitting in these areas could help infrastructure reach some of the state’s most remote communities.

The order also directs federal agencies to develop better ways to communicate how to acquire rights to federal rights-of-way, and where federally funded construction might be accessed by private or public broadband providers.

Long before the executive order was issued, employees of the city of College Place realized they had to find a better way to coordinate construction projects. College Place is one of the few places in the state with two electric utility companies, said Paul Hartwig, public works director for the city. The two companies did not coordinate construction projects, creating needless delays when one utility had to open a trench that was recently opened and closed by the other company. To remedy this, Hartwig started requiring stakeholders to talk to each other. Now no one gets a permit for installation of a utility or broadband without getting sign-off from each company in town that might have an interest in that same access.

The solution that works for College Place could be challenging elsewhere. However, permitting and inconsistent regulations have been identified as a barrier to deployment by many providers. In 2012, the Broadband Office and the Governor’s Office of Regulatory Assistance worked together with other state and local government staff to develop a permitting guidance publication⁴⁶ to help providers and municipal planners navigate federal, state, city, and county permitting processes. Broadband Office staff also made presentations to state planning forums,⁴⁷ and city and county associations on broadband benefits and barriers.





Support for Planning Process Leads to New Networks

Three Washington tribes began the process of broadband infrastructure construction during 2012. Colville's \$1.3 million Community Connect grant from USDA, mentioned earlier in the report, was just the latest project resulting from careful planning.

The Confederated Tribes and Bands of the Yakama Nation have launched the Yakama Nations Network, which is poised to offer broadband at speeds starting at 1 Mbps upload and download through its newly built infrastructure. The network will be managed through the Yakama Land Enterprises. The work was funded through tribal enterprises and it was made possible in part because of the tribe's partnership with NoaNet. NoaNet's statewide fiber build created redundancy for the broadband system on Yakama land.

In addition, the Quinault Indian Nation has nearly completed a \$260,000 broadband project funded through a capital investment by the tribe. The contractor for the project negotiated with private providers to create a network that will provide broadband access to more than 1,000 reservation residents by early 2013. Many of these residents either didn't have access to a provider or only had one available provider before the network was built. The project might not have been built at all if the tribe had not gotten a \$200,000 technical assistance grant from the USDA in 2010.

All three projects are not only success stories for traditionally underserved tribal lands, but also examples of how planning, funded through public and private sources, can turn a community's need for access into a reality.

Broadband Developments on the Horizon

While 2012 was a year of rapid infrastructure build-out and the final phase of Broadband Technology Opportunity Grants, it was by no means the end of changes to the rapidly growing broadband ecosystem. As policymakers and broadband stakeholders look to the future, there are a couple of developments worth watching.

City of Seattle Plans Ultrafast Network

In December 2012, Seattle signed an agreement⁴⁸ with broadband developer Gigabit Squared to connect 12 neighborhoods in the city to a high-speed fiber network riding on the city's unused fiber infrastructure. The agreement is part of Gig U, a nationwide initiative to bring gigabit speed broadband networks to communities surrounding universities. The University of Washington is

a partner in the Seattle network. Among the 12 communities to be connected are not only the tech-savvy University District and South Lake Union area, but also some of the city's lower-income neighborhoods. The plan also calls for construction of a dedicated gigabit broadband wireless network made possible by fiber transmitters on the top of 38 buildings across Seattle.

FirstNet: a Broadband Network for Public Safety

One of the outcomes of the terrorist attacks of Sept. 11, 2001, was the idea that police and firefighters could have handled the aftermath better if responders had shared information on a common platform or frequency. That idea was reiterated in the National Broadband Plan released in 2010. Among the plan's recommendations was one to "Support deployment of a nationwide, interoperable public safety mobile broadband network, with funding of up to \$6.5 billion in capital expenditures over 10 years, which could be reduced through cost efficiency measures and other programs. Additional funding will be required for operating expenses."

In February 2012, Congress created a new authority within the National Telecommunications and Information Agency, the First Responder Network Authority or FirstNet, to build, deploy, and operate a nationwide interoperable network for public safety.⁴⁹ The same act that created the new authority also provides \$7 billion in funding towards deployment of this network, as well as \$135 million for a new State and Local Implementation Grant Program administered by the agency. The grants will support state, regional, tribal, and local jurisdictions' efforts to plan and work with FirstNet to ensure the network meets their wireless public safety communications needs. The agency has recently finished taking comments on how that grant funding should be used.

Universal Service Fund Reform and Creation of the Connect America Fund

On Nov. 18, 2011, the Federal Communications Commission (FCC) unanimously adopted an order to comprehensively reform its Universal Service Fund and intercarrier compensation systems. Those systems have been widely viewed as broken and long overdue for reform. The reforms create a new Connect America Fund (CAF) with an annual budget of no more than \$4.5 billion, which is intended to extend broadband infrastructure to millions of Americans who currently have no access. The FCC estimates that over the next six years, CAF will expand broadband access to more than seven million residents of rural areas who are currently unserved, and will put the country on the path to universal broadband within a decade.



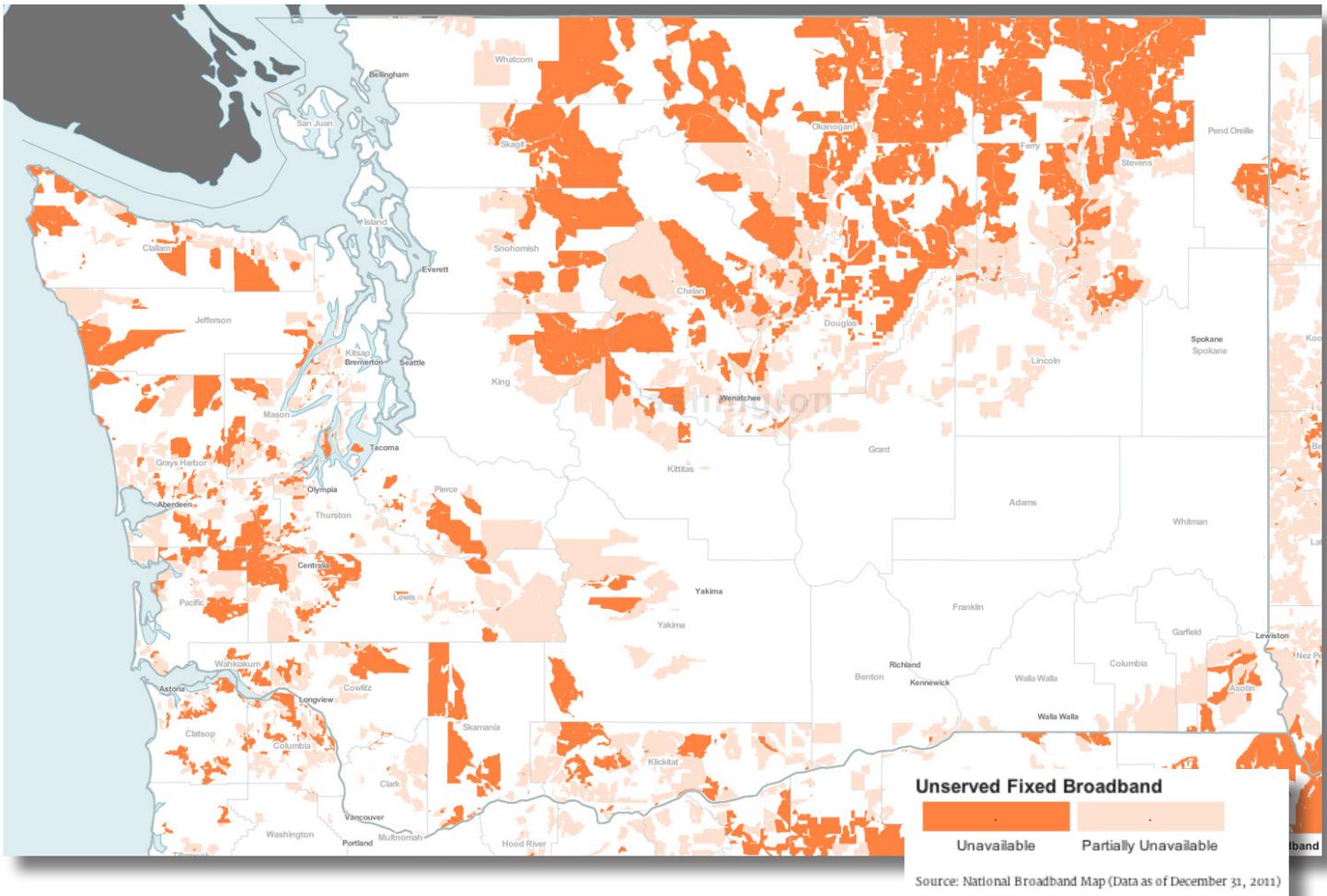
Broadband and Job Creation

A Mobility Fund also is created as part of the CAF to expand mobile broadband to thousands of road miles, and will include dedicated support for tribal areas. Inter-carrier compensation reforms are intended to eliminate hidden costs in consumer bills and thereby provide economic benefits to long distance and wireless consumers.

The CAF is designed to put America on the path to universal broadband and advanced mobile coverage without increasing costs to consumers. The FCC intends to eliminate waste in the current federal subsidy system used for voices services and retarget support to where it is most needed. Its reforms put universal service funding on a firm budget for the first time and the agency will impose strict accountability requirements on funding recipients

Broadband can be a tool for all kinds of improvements to the quality of life for residents in the state. A case could be made that health information technology helps improve chronic disease management or change unhealthy behaviors. Broadband already has opened up distance-learning opportunities for students in rural and remote school districts and for adults pursuing college degrees, even though they can't move to a university campus. But even as the state and the nation begin to pull out the recession, the primary focus of broadband discussions is its economic development and job creation potential.

Figure 9
Connect America Fund - Phase 1 Eligible Areas





More Competitive with Competitor States

For policymakers, it might be best to start by looking at how Washington is already doing in an increasingly tech-driven and competitive business climate. Commerce regularly compares our economic strength against competitor states – usually California, Colorado, Idaho, Maryland, Massachusetts, North Carolina, Oregon, Texas, and Virginia. These states either share borders or economic characteristics with Washington. Tech America’s Cyberstates Report ranks all 50 states on a number of technology measures, and Washington consistently ranks in the top 10 Cyberstates.

In the 2011 report,⁵⁰ Washington stands out in a number of measures (see Figure 10). Most notably, Washington is first in the nation in software publishers, thanks to Microsoft and spin-off companies often started by the software giant’s former employees. Washington also has the highest high-tech average annual

wage when compared to other private sector jobs. The 2012 New State Economy Index⁵¹ ranks the state eighth in the nation for high-tech jobs of all kinds and fourth in the nation for information technology jobs in particular.

Though most high-tech jobs rely on broadband at some level, Washington compares quite favorably with competitor states when it comes to the “app economy,” according to a recent study⁵² by CTIA, the Wireless Association. This economy, built on the development, marketing, and distribution of applications for mobile devices, such as smartphones and tablet computers, is heavily dependent on broadband.

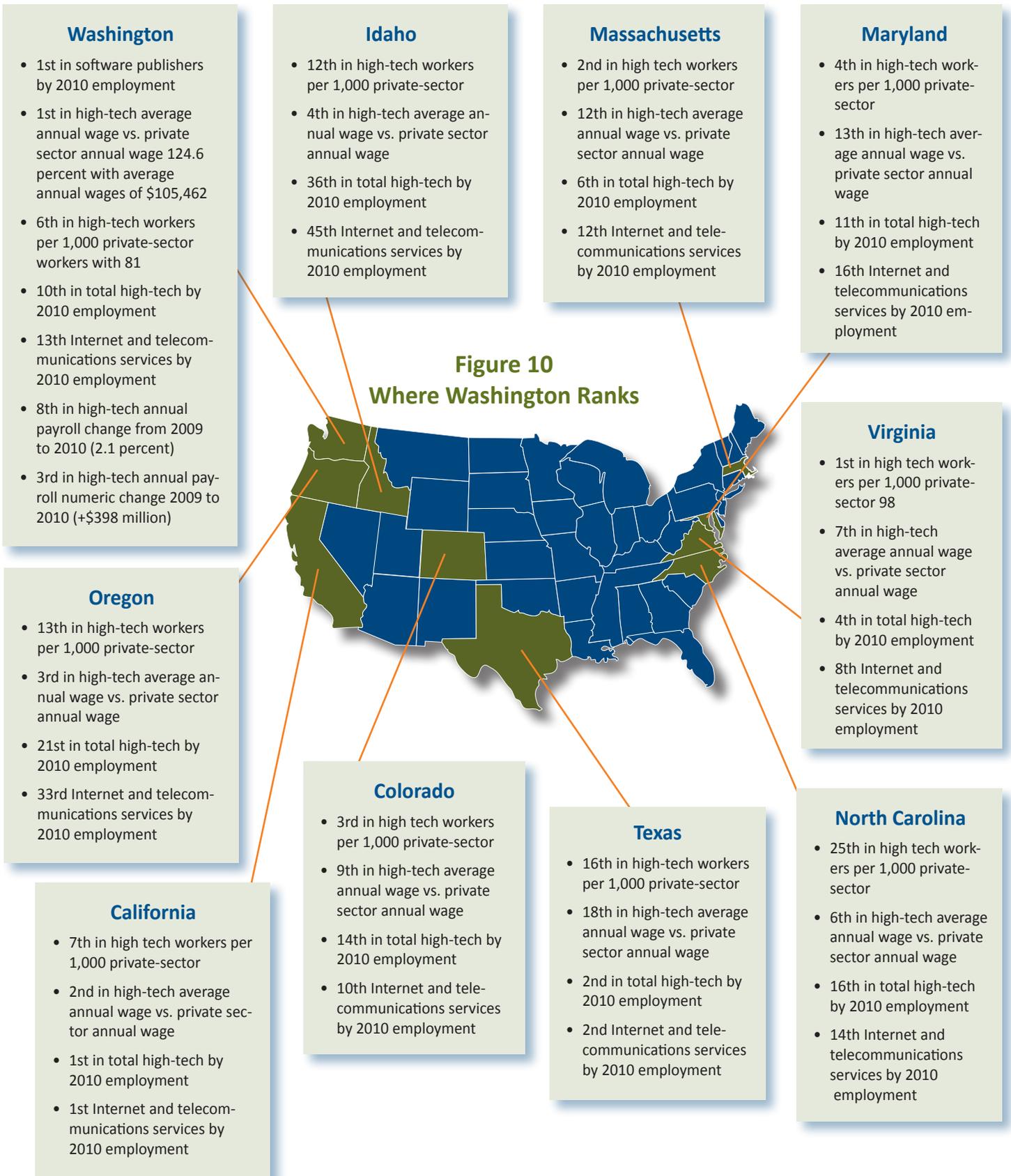
In this category, Washington is second only to California in number of apps economy jobs (49,800 in April of 2012) and first in the nation in apps employment intensity (the number of apps jobs in relationship to all jobs in the state).



It is not just a coincidence that these strong showings in tech- and Internet-dependent jobs exist in a state named number one in the 2012 TechNet State Broadband Index⁵³ and number three in the nation in the 2012 State New Economy Index.⁵⁴ One of the major factors in these designations was the state economy’s orientation toward broadband, including the high number of information, communication and technology jobs, as well as our high concentration of apps economy jobs.

However, these statistics really only address where we are now, not the state's potential to sustain or improve our standing among competitor states.

But Washington faces some stiff competition in areas where the state does not host an industry giant such as Microsoft or Amazon. This is how our competitor states stack up:





Unfilled Jobs Now, Uncertain Future for Washington Students

Washington’s statistics related to sustaining or improving standings amongst competitors don’t look so great, according to Susannah Malarkey, executive director of the Technology Alliance, a not-for-profit organization of leaders from Washington’s technology-based businesses and research institutions. The software engineers, biomedical researchers, aerospace workers, and clean technology inventors that have helped put Washington in the top tier of tech states all come from backgrounds in science, technology, engineering, or math (STEM).

Yet there is a significant disconnect between what is happening in our state’s tech-driven economy and our schools. As recently as 2007, Washington was graduating only 7.1 science and engineering students per 1,000 adults between the ages of 25 and 34.⁵⁵ That puts the state only five slots from dead last, and well behind the national average and all of the other “tech states.” Further, in 2009, 48 percent of recent high school graduates had to enroll in pre-college remedial math just to begin studying for their degree.

Although Washington is pulling out of a recession, the state’s recovery may be held back by a mismatch between skills of our resident workforce and the jobs created here. Between 2007 and 2010, Washington experienced a 41.9 percent change in skills mismatch, according the International Monetary Fund. The stats are no better at the elementary and secondary school levels. Washington is in 46th place in the nation for the amount of class time devoted to STEM topics, Doug Dowell, STEM coordinator for the Central Kitsap School District, said at a recent STEM Education Panel discussion.⁵⁶

Microsoft is already having difficulty recruiting qualified applicants for 4,000 unfilled jobs, 2,500 of those technical positions requiring a STEM background, said Adrian Wilson, chair of the Microsoft Higher Ed Consortium.⁵⁷

These statistics are particularly alarming as Washington has long been an important hub of the software and tech industries and needs an educated and skilled workforce to sustain that leadership position and retain a robust economy.

Translating Broadband into Economic Growth

Our state already has some the key elements for economic growth in place. Washington has a robust broadband network and a tech sector that’s already highly competitive with other states. Governor Christine Gregoire’s 2013-2015 budget includes \$20 million to expand STEM education at public colleges and universities, increasing our opportunities for a skilled workforce in the future.⁵⁸

It is already possible to start approximating what these elements add up to in economic growth. For instance, moving a community from no broadband providers to up to three providers is associated with 6.4 percent employment growth. That correlation is strongest in utilities, information, finance and insurance, professional, scientific, and technical services, according to a 2010 study by the Public Policy Institute of California.⁵⁹ The jobs most likely to increase – those in information, communications, and technology (ICT) – pay better than most jobs.

Washington State Rankings:
10th in High-Tech Employment
3rd in High-Tech Average Wage

The average annual wage for a high-tech worker in Washington is \$105,462, while the average wage for all private sector Washington workers is \$46,960, according to the 2011 Cyberstates Report.

Each of these of these jobs has a spillover or multiplier effect and a recent study by CTIA estimated that apps economy jobs alone annually have a \$2.7 billion impact on the state’s economy.⁶⁰ According to the Bay Area Council Economic Report issued in December 2012, a high-tech job can be associated with the creation of 4.3 additional jobs in the local economy.⁶¹

However, attracting high-skill, high-wage technology workers also requires access to broadband in the communities where they live. For instance, one wireless Internet service provider shared this story:

“One afternoon my child’s babysitter was talking to another one of the parents using her sitting service. This parent was upset because her husband was recently given a promotion at Microsoft, enabling them to move out of their tiny apartment in town to a larger home more appropriate for raising their three young girls.

“The new house was only two miles away from their apartment, so they expected the same broadband they had before. WRONG. Now instead of working from home, and seeing his girls grow up, he had to get up very early for an hour-long commute in a car that gets 12 mpg, work a 14-hour day then drive home, just in time to see his daughters off to bed.

“My child’s babysitter gave them my company’s number. We installed high-speed broadband compatible with Microsoft’s work from home VPN software in less than one day.



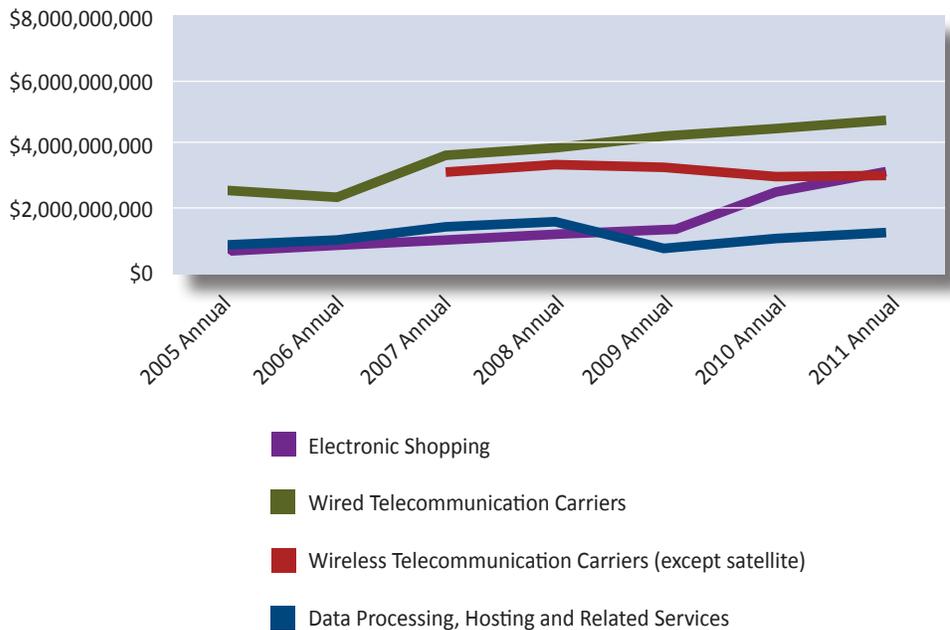
We did four important things that day: we helped a family; we helped a community (this guy is a GREAT soccer coach for my daughter); we reduced congestion and pollution by getting another vehicle off road during rush hour; and we helped a larger company with an employee that can now respond to issues from home 24 hours a day.”

This kind of scenario is becoming more common – Cyberstates Report named Washington as number one in high-tech job concentration. The growth of these high-wage jobs is helping Washington diversify its economy, as the state’s 84,000 aerospace industry jobs⁶² are eclipsed by software jobs, which stood at more than 183,000 in 2010.

High-tech jobs are only part of the equation. Washington’s online retail economy, led by online retailing giant Amazon, continued to flourish even through the recession. Gross business income from electronic shopping topped \$2.6 billion in 2010 and topped \$3.1 billion in 2011 according to the Washington State Department of Revenue (see Figure 11).

The electronic shopping numbers reflect online sales of anything from tennis shoes to tents. Incorporated in that total are sales of broadband-related goods and services. In fact, the per capita retail sales for telecommunication related industries have topped more than \$20,000 in four Washington counties for the second year in a row. King, Pierce, and Snohomish are the most populated and tech-heavy counties in the state, but Grant County, with a half-dozen large data centers, also generates hefty communications-related retail sales numbers.

Figure 11
Broadband-Related Gross Business Income
in Washington

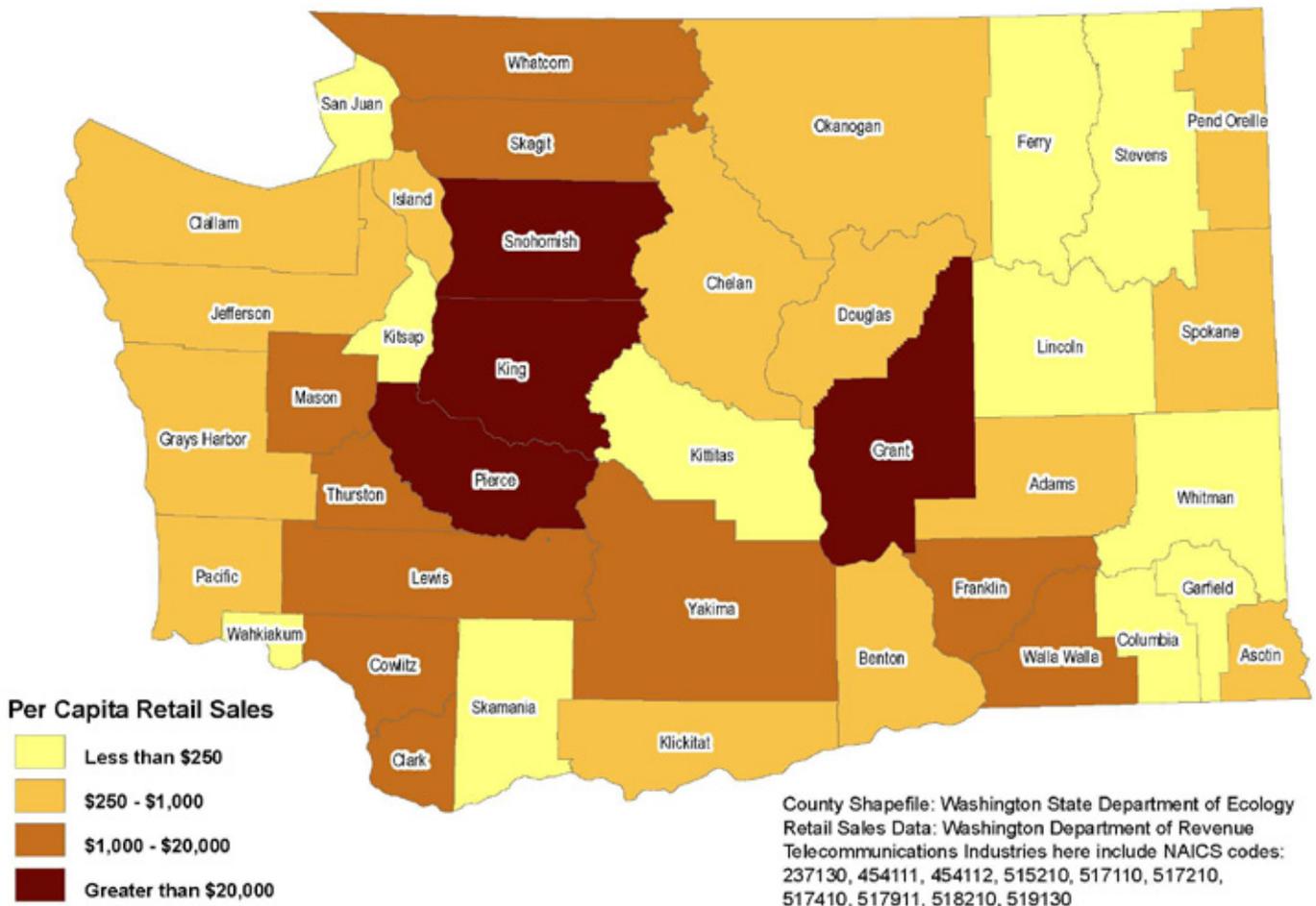




Retail sales are a good example of how broadband helps boost state revenue, but connectivity also helps in other ways. The Central Washington town of Odessa (population 910) hosts a large dirt bike race every year, drawing roughly 6,000 visitors to the community for that one weekend event. A local wireless Internet service provider offers fixed wireless services to the site, at no charge, and Wi-Fi out to the attendees and vendors. The services turned out to be so popular the provider is installing

larger systems and more access points this year. As a result of this new connectivity, visitors this year will be able to come to town earlier and stay longer because they can work and stay in touch while at the event. This is expected to add increased revenue from more lodging, dining, and shopping to an event that an Odessa Chamber of Commerce study found already brings in between \$75,000 and \$100,000 dollars to the local businesses.

2011 Per Capita Retail Sales by County For Selected Telecommunications Industries



Conclusion – What Got Us Here and How Do We Keep It?

Washington State was recently named the top state in the nation in a TechNet’s 2012 State Broadband Index.⁶³ The designation may not be a surprise given the state’s consistent showing in the top 10 tech states in the nation. What is more telling are the characteristics identified across all states with strong or improving broadband climates. Those characteristics are:

- Executive and legislative leadership.
- State funding.
- Cooperation.
- Planning.

Washington has enjoyed the support of governors who have understood the value of a broadband network to our state’s economic development. Their belief was supported by legislative leadership that created the CTOP and the Broadband Office.

State funding also supported the effort, not only as a one-time jump-start for CTOP program, but also as ongoing state matching funds for federal grants, such as the State Broadband Initiative grant. That support allowed the Broadband Office to help facilitate cooperation across broadband stakeholders, starting with a statewide summit in 2010 and continuing with collaboration with public and private broadband providers to identify and address broadband issues in the state.

Washington also has led the way with broadband planning. The CTOP program established standards for adoption programs, and two committees convened by Governor Gregoire established state priorities for broadband development. Broadband planning continues through local technology planning teams working to address stubborn access and adoption issues across the state.

These four characteristics seem to be part of the state’s DNA when it comes to broadband issues, and they are likely to put broadband stakeholders in good stead as we face the future of broadband’s dynamic ecosystem.

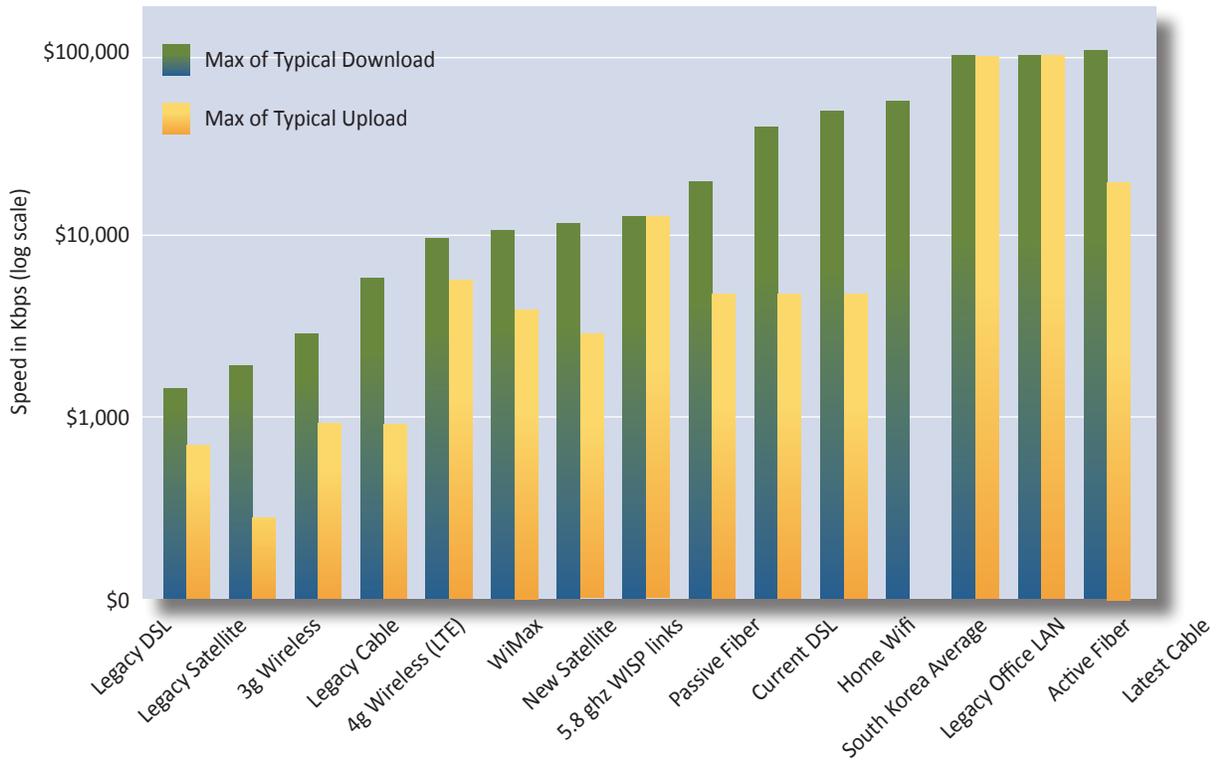




Guide to Technology and Terminology

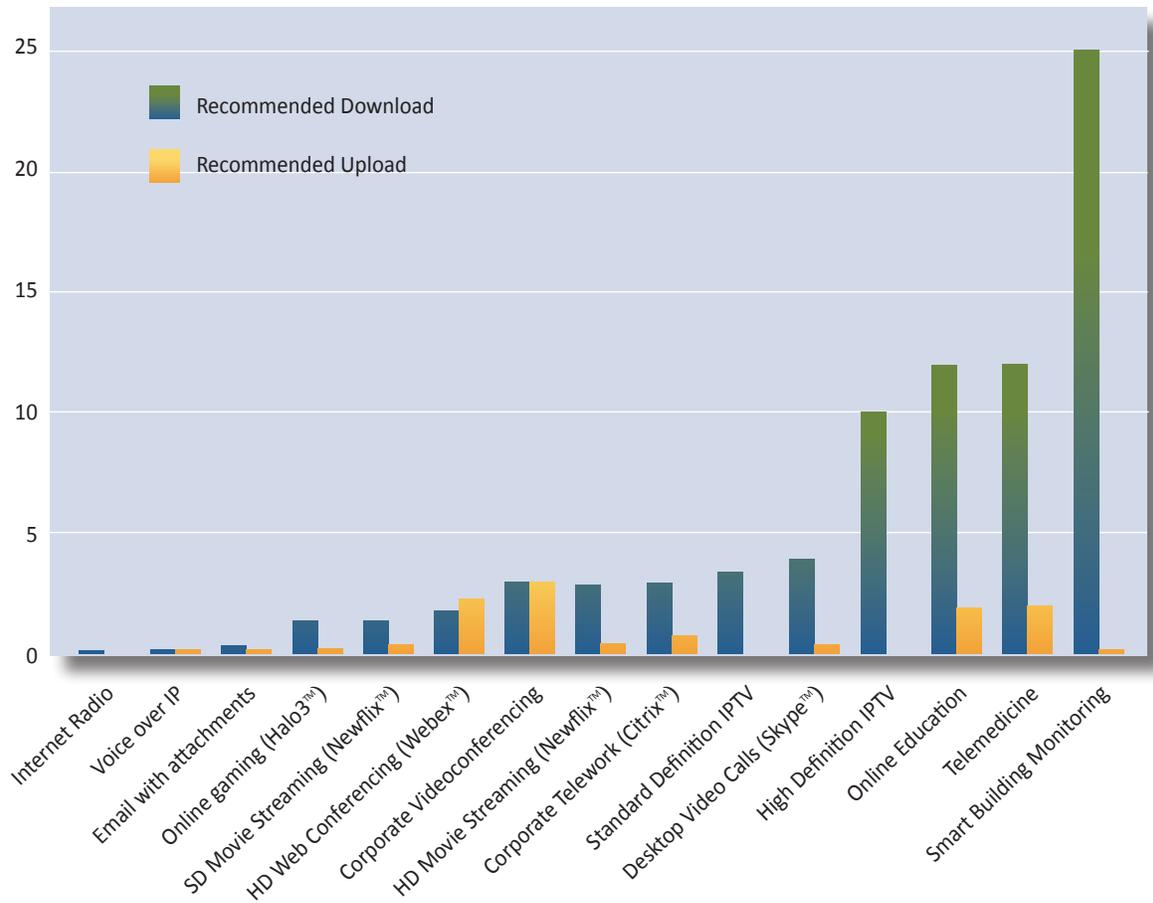
To understand broadband service, it is helpful to know how technologies differ and the capacity of different speeds of service.

Estimated Network Speeds by Technology





Minimum Speeds for Common Applications



Broadband Terminology

BIP

Broadband Initiatives Program disperses American Recovery and Reinvestment Act (ARRA) broadband funding from the U.S. Department of Agriculture Rural Utilities Service. BIP supports last-mile networks.

BTOP

Broadband Technologies Opportunity Program is the program that disburses from the American Recovery and Reinvestment Act (ARRA) broadband funding National Telecommunications and Information Agency (NTIA). BTOP supports middle-mile infrastructures and sustainable adoption programs.

Cable Modem

Cable modem service enables cable operators to provide broadband using the same coaxial cables that deliver pictures and sound to your TV set.

CCN

Communities Connect Network is a consortium of community technology experts from the nonprofit and public sector in Washington State.

CTOP

Community Technology Opportunity Program is an adoption program administered by the Washington State University from 2008 to 2009.

DSL

DSL or digital subscriber line is a wireline transmission technology that transmits data faster over traditional copper telephone lines already installed. DSL can either be asymmetrical with different download and upload speeds or symmetrical with equal downstream and upstream speeds.

Fiber

Fiber-optic technology converts electrical signals carrying data to light and sends the light through transparent glass fibers about the diameter of a human hair. Fiber transmits data at speeds far exceeding current DSL or cable modem speeds, typically by tens or even thousands of Mbps.

Mbps

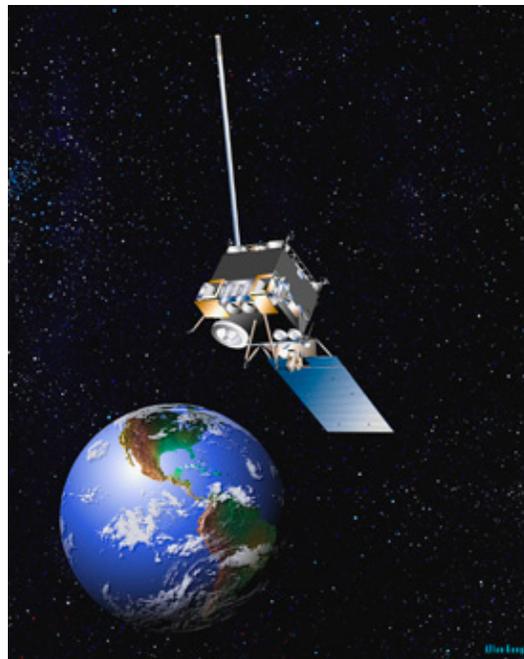
Megabits-per-second is a unit of network speed. Every page, image and video on the web comes to a device as small pieces of data, or packets. How fast these packets move on the network is measured in Megabits per second, abbreviated Mbps.

Satellite

Just as satellites orbiting the earth provide necessary links for telephone and television service, they can also provide links for broadband services. Satellite broadband is another form of wireless broadband.

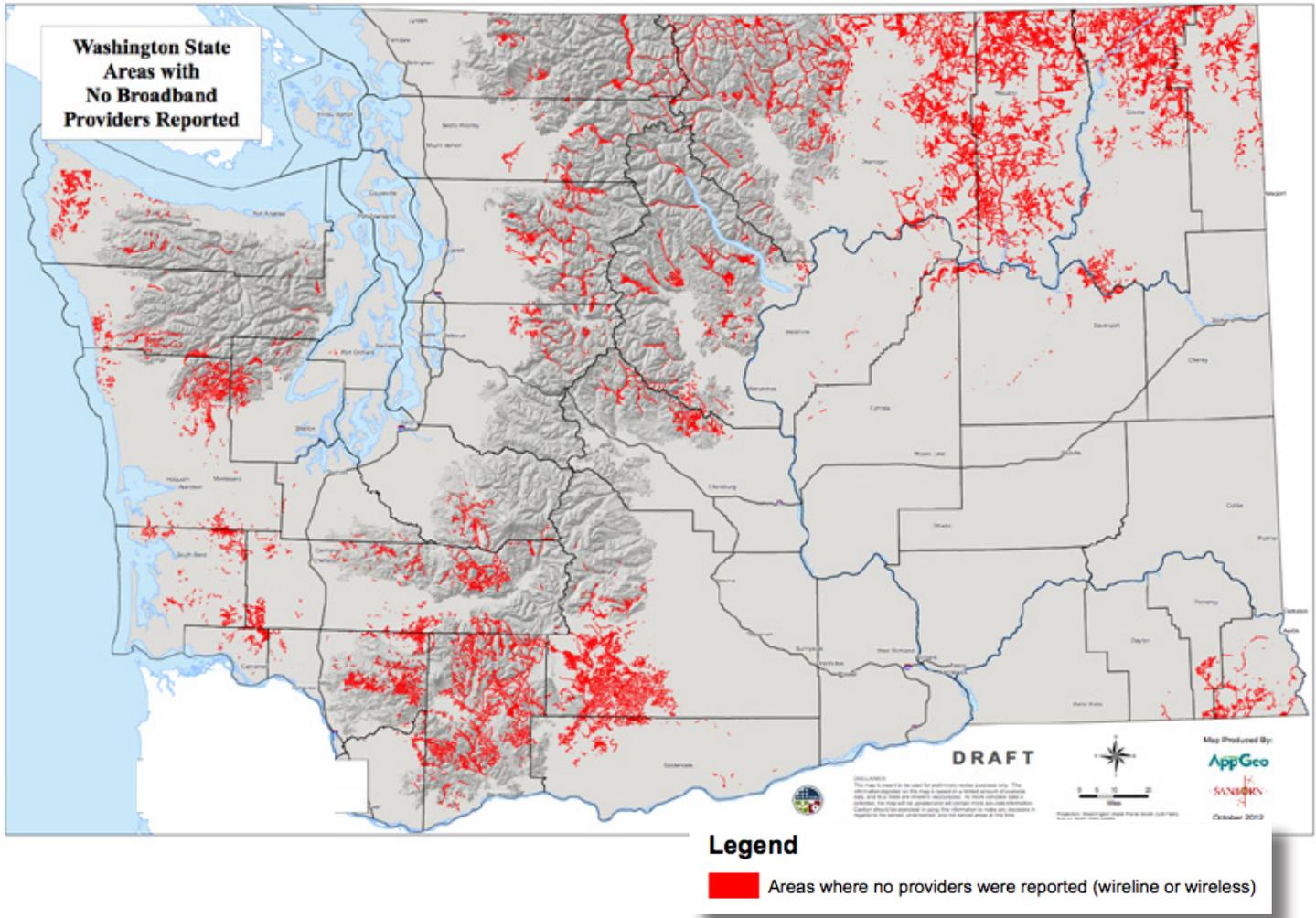
Wireless

Wireless broadband in Washington can be mobile or fixed. Mobile wireless services such as “3G” and “4G” offerings from major providers use nationally licensed radio frequencies to offer broadband speeds for mobile devices; fixed wireless services use a combination of licensed and unlicensed radio frequencies to deliver broadband to homes, businesses and other fixed locations.



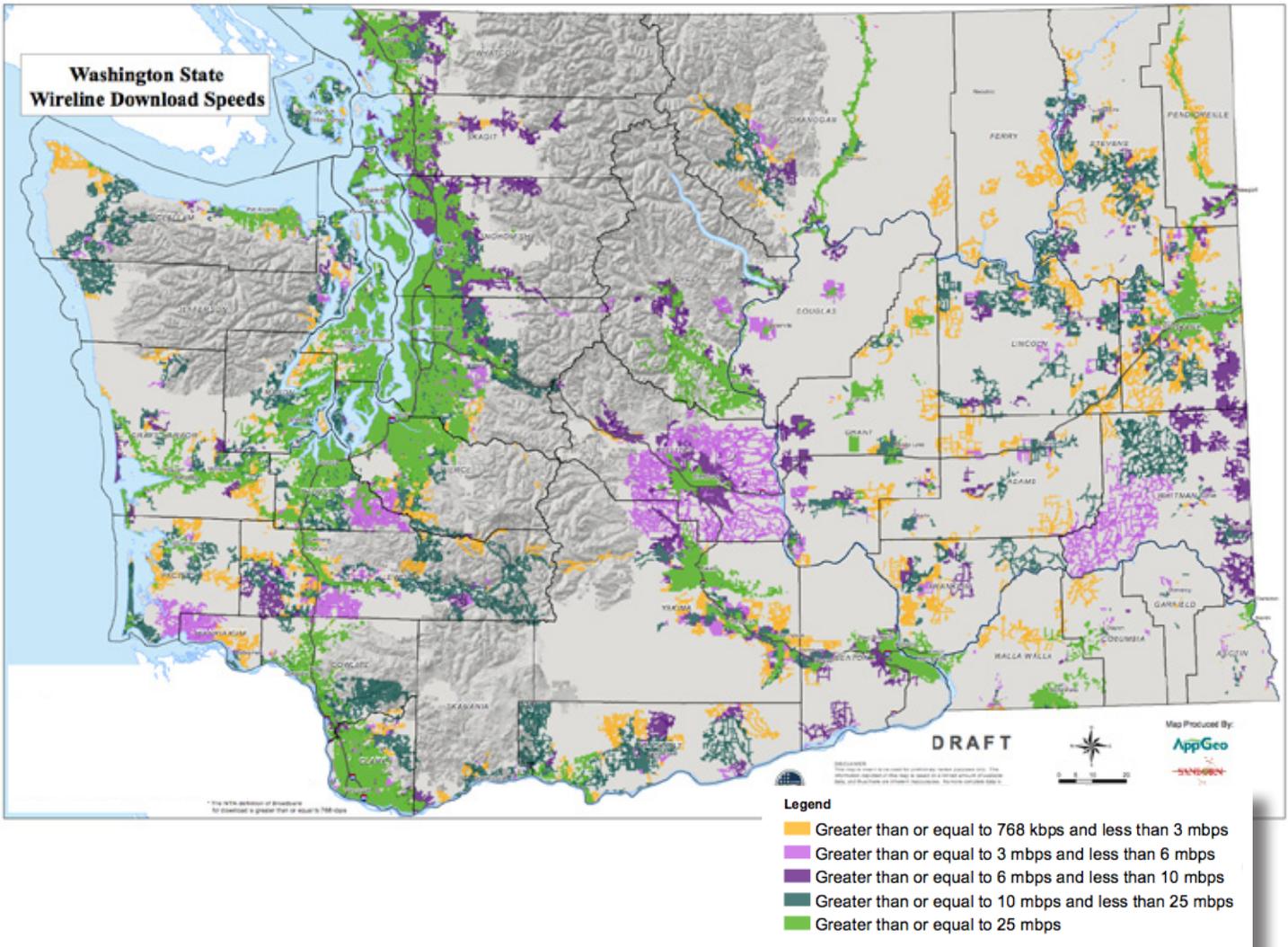
Appendix A: Broadband Maps

Areas With No Broadband Providers Offering at Least 768 Kbps



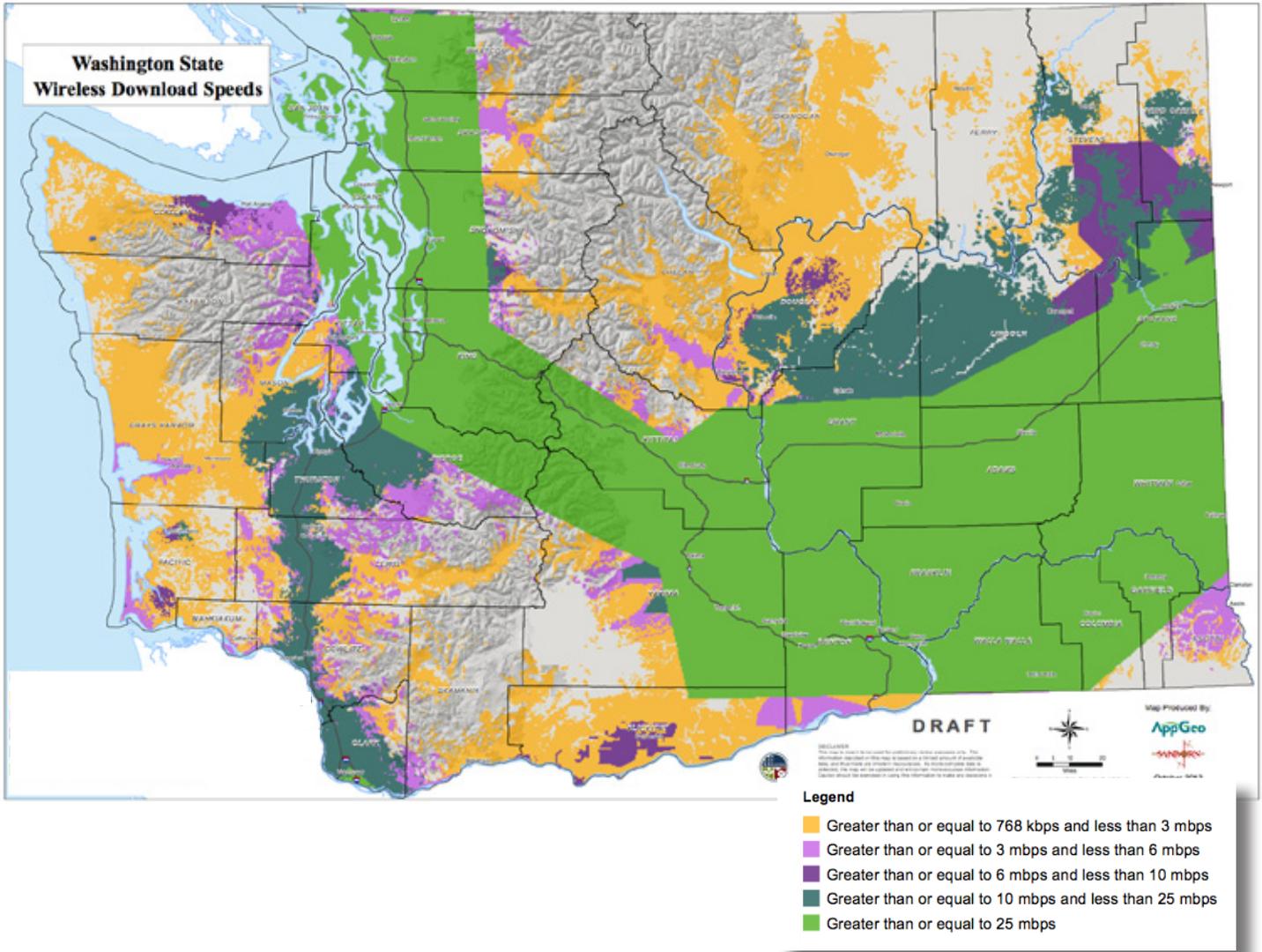


Wireline Download Speeds



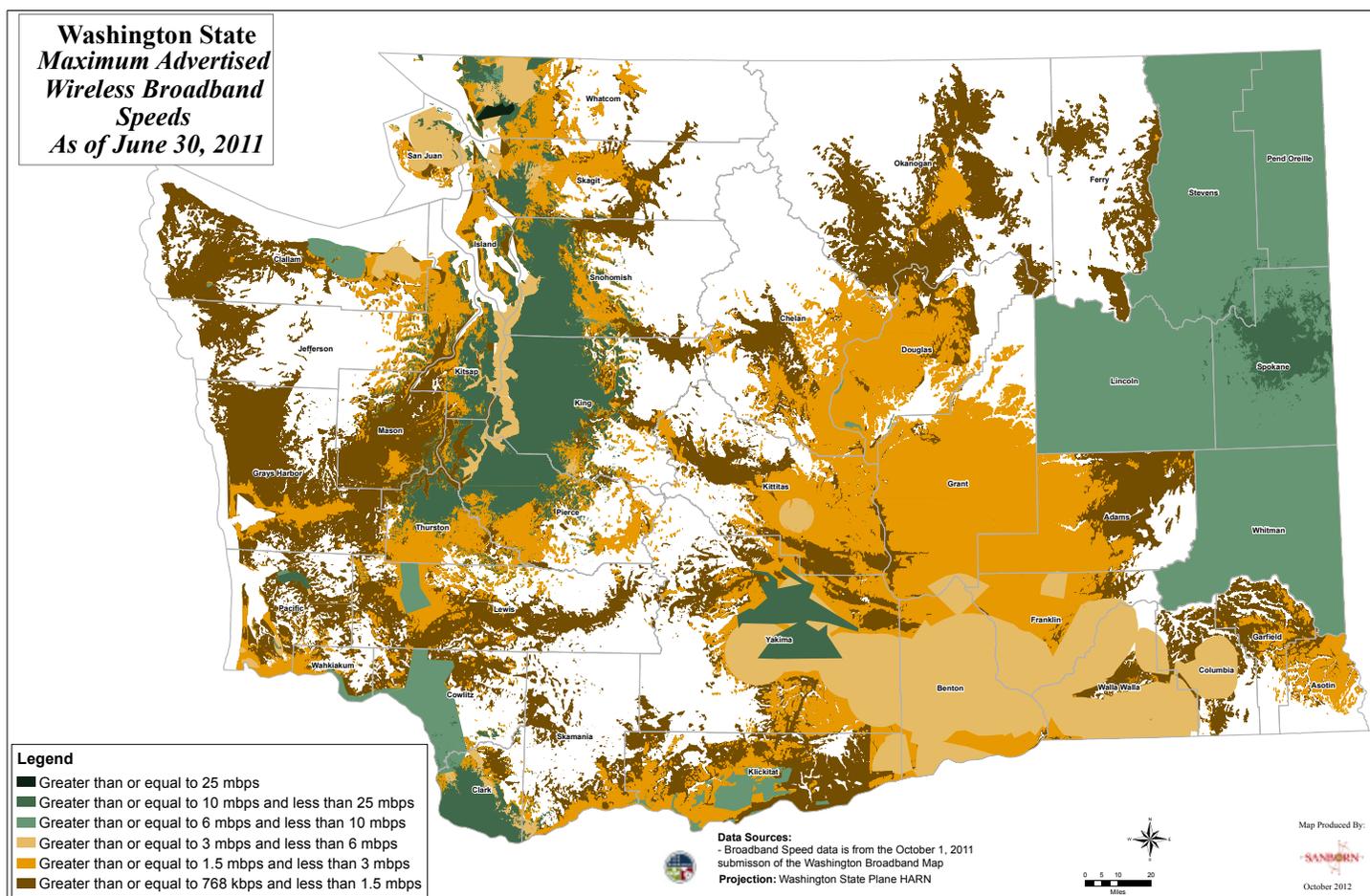


Wireless Download Speed



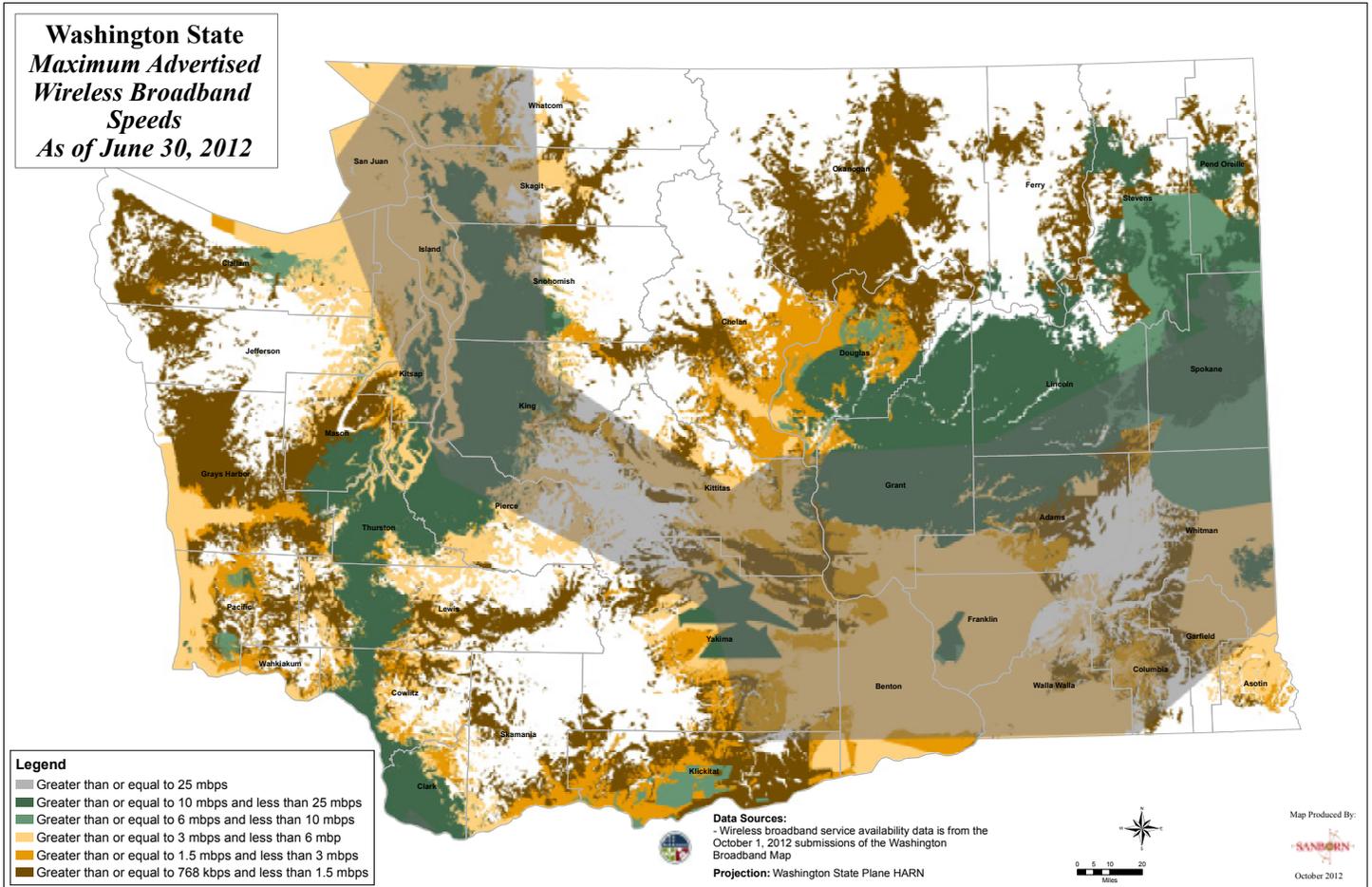
Appendix B: Wireless Areas of Change

Wireless Broadband Speeds as of June 30, 2011





Wireless Broadband Speeds as of June 30, 2012





End Notes

¹Washington State Broadband Map <http://wabroadbandmapping.org/InteractiveMap/>

²National Broadband Map <http://www.broadbandmap.gov>

³<http://www.broadbandmap.gov/rank/all/state/percent-population/within-nation/speed-download-greater-than-3mbps-upload-greater-than-0.768mbps/ascending/>

⁴<http://www.broadbandmap.gov/rank/all/state/percent-population/within-nation/number-of-any-service-providers-0/ascending>

⁵<http://www.broadbandmap.gov/summarize/state/washington>

⁶http://www.recovery.gov/About/Pages/The_Act.aspx

⁷Broadband USA <http://www2.ntia.doc.gov/>

⁸USDA website About the Recovery BIP http://www.rurdev.usda.gov/utp_bip.html

⁹Broadband USA <http://www2.ntia.doc.gov/grantees/NOANet>

¹⁰Broadband USA website accessed Nov. 20, 2012 <http://www2.ntia.doc.gov/grantee/northwest-open-access-network-noanet>

¹¹NoaNet <http://www.washingtonbroadband.org/broadband-expansion.aspx>

¹²Broadband USA website accessed Nov. 20, 2012 <http://www2.ntia.doc.gov/grantees/PendOrielle>

¹³Wenatchee World website accessed Nov. 20, 2012 <http://www.wenatcheeworld.com/news/2011/apr/12/chelan-pud-will-give-up-fiber-grant/>

¹⁴<http://www.recovery.gov/Transparency/RecipientReportedData/pages/RecipientProjectSummary508.aspx?AwardIdSur=116093>

¹⁵<http://www.recovery.gov/Transparency/RecoveryData/Pages/RecipientProjectSummary508.aspx?AwardIdSur=113546>

¹⁶<http://www.recovery.gov/Transparency/RecoveryData/Pages/RecipientProjectSummary508.aspx?AwardIDSUR=111955&qtr=2010Q4>

¹⁷<http://www.recovery.gov/Transparency/RecoveryData/pages/RecipientProjectSummary508.aspx?AwardIdSur=112723>

¹⁸Washington State Broadband Office website accessed Nov. 23, 2012 <http://www.commerce.wa.gov/Programs/Infrastructure/Broadband/Pages/CommunityUpdate.aspx>

¹⁹<http://www.dailyfinance.com/2012/10/10/frontier-communications-speeds-broadband-depoyment/>

²⁰http://seattletimes.com/html/technologybriertudleysblog/2019685723_post_58.html

²¹Washington State Broadband Office <http://www.commerce.wa.gov/Programs/Infrastructure/Broadband/Pages/default.aspx>

²²2012 New State Economy Index <http://www.itif.org/publications/2012-state-new-economy-index>

²³Home Broadband 2010 Report, Pew Internet and American Life Project <http://www.pewinternet.org/Reports/2010/Home-Broadband-2010.aspx>

²⁴Internet Access Services Status Report, Federal Communications Commission http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-314630A1.pdf

²⁵U.S. Census Bureau Computer and Internet Use <http://www.census.gov/hhes/computer/publications/2010.html>

²⁶http://www.ntia.doc.gov/files/ntia/publications/exploring_the_digital_nation_computer_and_internet_use_at_home_11092011.pdf

²⁷2012 New State Economy Index <http://www.itif.org/publications/2012-state-new-economy-index>

²⁸<http://www.pewinternet.org/Reports/2012/Cell-Internet-Use-2012/Main-Findings/Cell-Internet-Use.aspx>

²⁹http://www2.ntia.doc.gov/files/grantees/53-42-b10585_edlab_group_foundation_ppr2012_q2.pdf

³⁰<http://archive.constantcontact.com/fs004/1101376239733/archive/1110585990631.html>

³¹Broadband USA website accessed Nov. 21, 2012 <http://www2.ntia.doc.gov/grantees/TINCANWApcc>

³²Broadband USA website accessed Nov. 21, 2012 <http://www2.ntia.doc.gov/grantees/TINCANWAsba>

³³Broadband USA website accessed Nov. 21, 2012 <http://www2.ntia.doc.gov/grantee/toledo-telephone-company-inc>



³⁴Broadband USA website accessed Nov. 21, 2012 <http://www2.ntia.doc.gov/grantee/zerodivide>

³⁵Washington Community Technology Opportunity Program Final report <http://dgss.wsu.edu/ctop/>

³⁶<http://wabroadbandmapping.org/>

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³⁸Evergreen Apps Challenge <http://www.evergreenapps.org/>

³⁹Startup Weekend <http://seattlegov.startupweekend.org/>

⁴⁰Front and Center online newsletter <http://www.nga.org/cms/home/nga-center-for-best-practices/front-center-newsletters/2012--front--center-newsletters/col2-content/front-center---october-19-2012.html#State1>

⁴¹Evergreen Apps Challenge <http://www.evergreenapps.org/>

⁴²Geography.wa.gov <http://geography.wa.gov/GeospatialPortal/index.shtml>

⁴³Communities Connect website accessed Nov. 24, 2012 <http://www.communitiesconnect.org/node/4972>

⁴⁴<http://www.whitehouse.gov/the-press-office/2012/06/14/executive-order-accelerating-broadband-infrastructure-deployment>

⁴⁵Congressional Research Services Federal Land Ownership Overview and Data report February, 2012 <http://bit.ly/YuGhJJ>

⁴⁶http://www.ora.wa.gov/documents/broadband_projects.pdf

⁴⁷Education Resources for Planners, Department of Commerce <http://www.commerce.wa.gov/Services/localgovernment/GrowthManagement/Education-Resources-for-Planners/Pages/default.aspx>

⁴⁸<http://www.geekwire.com/2012/live-mayor-mike-mcginn-announces-plan-develop-ultrafast-broadband-network/>

⁴⁹National Telecommunications and Information Agency website <http://www.ntia.doc.gov/category/public-safety>

⁵⁰<http://www.techamericafoundation.org/cyberstates>

⁵¹2012 State New Economy Index <http://www.itif.org/publications/2012-state-new-economy-index>

⁵²<http://www.ctia.org/media/press/body.cfm/prid/2212>

⁵³2012 TechNet State Broadband Index <http://www.technet.org/technet-state-by-state-broadband-report/>

⁵⁴2012 New State Economy Index <http://www.itif.org/publications/2012-state-new-economy-index>

⁵⁵http://westsoundtechnology.org/news/downloads/doc_download/219-wsta-2011-10-20-summit-wtia-malarkey-presentation

⁵⁶http://kpbj.com/events/kitsap_community/2012-11-15/20227/stem_education_panel

⁵⁷Email interview with Adrian Wilson, November 2012

⁵⁸Governor Christine Gregoire's proposed 2013-15 budget <http://www.ofm.wa.gov/budget13/default.asp>

⁵⁹Public Policy Institute of California <http://www.ppic.org/main/publication.asp?i=866>

⁶⁰<http://www.ctia.org/media/press/body.cfm/prid/2212>

⁶¹Technology Works: High Tech Employment and Wages in the United States https://s3.amazonaws.com/engine-advocacy/TechReport_LoRes.pdf

⁶²Washington Aerospace Partnership <http://www.washington-aerospace.com/data.php>

⁶³TechNet, <http://www.technet.org/>